Vol. 941 Number 4

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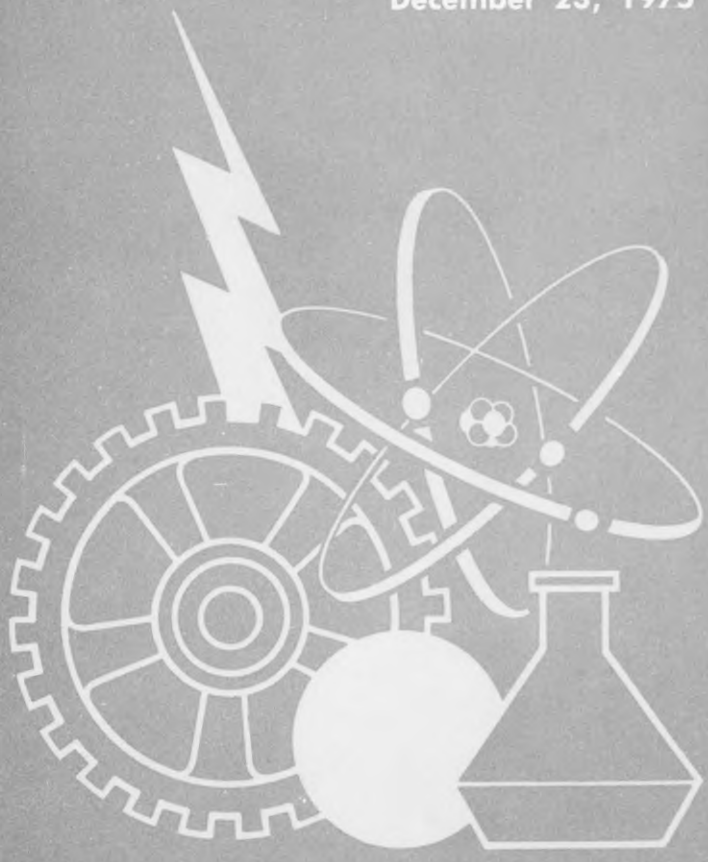
PATENTS

December 23, 1975



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December 23, 1975 Volume 941 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

National Inventor's Day

The 4th Annual National Inventor's Day Exhibit will be held on Saturday and Sunday, February 7 and 8, 1976 at the Patent and Trademark Office in Arlington, Virginia.

Limited space is available for appropriate display and demonstration of patented materials, devices or methods.

Inventors or firms interested in participating in this public exhibit are urged to contact the National Inventor's Day Committee of the Patent and Trademark Office (phone 703 557–3428). Communications should be directed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. Attn: Oscar Mastin, Office of Information Services.

I. J. ROTKIN,
Chairman.

Dec. 1, 1975.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

1,643,646, G. W. Swift, Jr., SHEET FEEDING MEANS; **2,737,388,** I. S. Gottscho, FEEDING MECHANISMS FOR MARKING MACHINES; **3,279,786,** Fliegner and Hinz, PNEUMATIC APPARATUS FOR INDIVIDUALLY SEPARATING FLAT ITEMS; **3,588,095,** Ward, Ward and Bachmann, SUCTION TABLE SYSTEM FOR FEEDING OF WARPED SHEETS, **filed** July 20, 1972, D.C.N.J. (Camden), Doc. C–1256–72, *The Ward Machinery Company (formerly The Ward-Turner Machinery Company)* v. *The Langston Company.*

2,737,388. (See 1,643,646.)

2,972,349, R. A. De Wall, CAPILLARY OXYGENATOR; **3,228,876,** R. J. Harmstorf, SYSTEM AND APPARATUS TO PLACE FLEXIBLE PIPES AND CABLES UNDER GROUND BELOW WATER; **3,546,209,** B. J. Lipps, Jr., PROCESS FOR THE FABRICATION OF A CELLULOSE HOLLOW FIBER SEPARATORY CELL, **filed** Mar. 6, 1975, D.C. Del. (Wilmington), Doc. 75–67, *Cobe Laboratories, Inc. and Abcor, Inc.* v. *The Dow Chemical Co., Cordis Dow Corp. and The Regents of the University of Minnesota.*

2,973,213, B. H. Kass, VIBRATION ISOLATION ARRANGEMENTS, **filed** Aug. 26, 1975, D.C., N.D.N.Y. (Utica), Doc. 75–CV–425, *G. A. Braun, Inc.* v. *Machinery Mountings, Inc.*

3,033,988, H. E. Edgerton, METHOD OF AND APPARATUS FOR THE CONTROL OF ELECTRIC IMPULSES; **3,519,879,** F. T. Ogawa, FLASH APPARATUS WITH AUTOMATIC LIGHT TERMINATION HAVING GATING AND ANTICIPATION MEANS; **Re. 26,998,** N. F. Brown, LOW FRICTION SEALED AND LOW TORQUE ACTUATED TRUNNION MOUNTED VALVE, **filed** Feb. 26, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c515, *Honeywell, Inc. and EG & G Inc.* v. *Metz Apparatewerke et al.* Enter order of dismissal, Apr. 2, 1975.

3,047,196, Levine and Phillips, GARMENT HANGER, **filed** Sept. 12, 1974, D.C.N.J. (Trenton), Doc. C–74–1414, *Warbern Packaging Industries, Inc.* v. *The Harwood Company, Inc.* Action administratively terminated by order of United States District Judge, as it is stayed pending disposition of similar or related litigation in Southern District of New York, Sept. 4, 1975.

3,198,043, P. K. Davis, PIPE CUTTING AND HANDLING APPARATUS; **3,247,692,** same, PIPE MAKING MACHINE AND METHOD; **3,257,881,** same, PIPE CUTTING AND HANDLING METHOD, **filed** June 30, 1975, D.C., N.D. Calif. (San Francisco), Doc. C–75–1353–SC, *Ironside's Machine & Welding Ltd.* v. *Pacific Roller Die Co., Inc.*

3,228,876. (See 2,972,349.)

3,241,876, W. S. Saunders, APPARATUS FOR REDUCING LINEAR AND LATERAL WIND RESISTANCE IN A TRACTOR-TRAILER COMBINATION VEHICLE, **filed** Feb. 27, 1975, D.C. Conn. (New Haven), Doc. N–75–51, *Uniroyal, Inc.* v. *Rudkin-Wiley Corporation.*

3,241,876, W. S. Saunders, APPARATUS FOR REDUCING LINEAR AND LATERAL WIND RESISTANCE IN A TRACTOR-TRAILER COMBINATION VEHICLE; **3,309,131,** same, MEANS FOR REDUCING LINEAR WIND RESISTANCE IN SINGLE CHASSIS TYPE VEHICLES, **filed** Feb. 5, 1975, D.C., N.D. Ala. (Birmingham), Doc. CA 75–G–0143–S, *W. Selden Saunders and Rudkin-Wiley Corporation* v. *Avondale Mills and W. W. Murphree.*

3,247,692. (See 3,198,043.)

3,257,881. (See 3,198,043.)

3,279,786. (See 1,643,646.)

3,309,131. (See 3,241,876.)

3,323,437, J. V. Knab, FILTER SYSTEM; **3,465,666,** same, CLEAN ROOM FILTERING METHOD; **3,522,724,** same, METHOD AND APPARATUS FOR TESTING CLEAN ROOM FILTRATION EFFICIENCY, **filed** Apr. 2, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c1060, *The Robert Irsay Company, etc.* v. *The Jade Corporation et al.*

3,353,528, D. E. Robinson, HEATER CONSTRUCTION; **Re. 27,392,** same, **filed** July 11, 1975, United States Court of Appeals, Sixth Circuit, Ohio (Cincinnati), Doc. 74–1841, *Philips Industries, Inc. and Mobil Temp, Inc.* v. *State Stove & Manufacturing Co., Inc.* Decision reversed, holding the patent to be invalid, and therefore, do not reach the infringement issue, July 11, 1975.

3,403,484, G. Redey, ADJUSTABLE CONSTRUCTION JOINT STRIPS; **3,518,801,** same; **3,603,025,** W. Heubel, ELEMENTS WITH PLURAL SURFACES HAVING UNIFORMLY SPACED INTERFITTABLE PROJECTIONS, **filed** July 18, 1975, D.C., S.D.N.Y., Doc. 75–C–3536, *George Redey* v. *Hasbro Industries, Inc. and Propper-Werk GmbH.*

3,424,496, W. A. Prough, VEHICLE PASSENGER SAFETY DEVICES, **filed** Feb. 15, 1974, D.C., S.D. Ind. (Indianapolis), Doc. IP74–100–C, *Wendell Arthur Prough* v. *Borg-Warner Corporation.*

3,465,666. (See 3,323,437.)

3,499,302, Spain, Oliver, Flora and Powell, CYLINDER LOCK; **Reg. No. 878,843** (GREAT LEGS AND DESIGN), Richmar Products, Inc., **filed** Apr. 22, 1975, D.C., N.D.N.Y. (Utica), Doc. 75–CV–191, *Medeco Security Locks, Inc.* v. *Dominion Lock-USA, Inc. and Dominion Lock Company Ltd.*

3,518,800, H. G. Tank, FLOORING SYSTEM, **filed** Sept. 19, 1974, D.C., W.D. Tenn. (Memphis), Doc. C–74–506, *Connor Forest Industries* v. *Robbins Flooring Company.* Consent decree, patent is valid, defendant is enjoined from infringing said patent except as provided in the settlement agreement between the parties, Sept 10, 1975.

3,518,801. (See 3,403,484.)

3,519,879. (See 3,033,988.)

3,522,724. (See 3,323,437.)

3,546,209. (See 2,972,349.)

3,574,070, C. Sahely, METAL PLATING OVER PLASTIC; **3,615,732,** Shipley, Shipley, Gulla and Dutkewych, ELECTROLESS COPPER PLATING; **3,728,137,** same, **filed** Sept. 12, 1974, D.C. Conn. (Hartford), Doc. H–74–282, *Shipley Co. Inc.* v. *MacDermid Corporation.* Stipulated that action be dismissed without prejudice, June 19, 1975.

3,588,095. (See 1,643,646.)

3,603,025. (See 3,403,484.)

3,615,732. (See 3,574,070.)

3,682,076, I. Erlichman, SUPPORT MEMBER FOR PREVENTING INVERTED INSERTION OF A FILM CASSETTE; **3,705,537,** R. Paglia, APPARATUS FOR INTERFACING PHOTOGRAPHIC CAMERA AND FILM CARTRIDGE; **3,709,122,** Blinow and Leduc, FILM ADVANCING APPARATUS; **3,766,842,** J. M. Whall, PHOTOGRAPHIC FILM PROCESSING APPARATUS; **3,776,118,** Driscoll and Whall, PHOTOGRAPHIC FILM PROCESSING APPARATUS; **3,779,144,** R. Paglia, PHOTOGRAPHIC FILM PROCESSING APPARATUS AND CAMERA SYSTEM EMPLOYING SAME; **3,810,211,** Wareham and Paglia, SELF-DEVELOPING CAMERA SYSTEM; **3,810,220,** R. Paglia, DETACHABLE SPREAD ROLLER HOUSING SECTION; **3,854,809,** J. J. Driscoll, PHOTOGRAPHIC APPARATUS; **Re. 28,054,** A. J. Bachelder, PHOTOGRAPHIC APPARATUS AND METHOD, **filed** July 3, 1975, D.C. Del. (Wilmington), Doc. 75–179, *Polaroid Corporation* v. *Berkey Photo, Inc.*

3,705,537. (See 3,682,076.)

3,709,122. (See 3,682,076.)

3,709,623, H. N. Stephan and L. C. Seager, COMBINED BORING, DRILLING AND MILLING MACHINE, filed Aug. 29, 1975, D.C., E.D. Mich. (Detroit), Doc. 75–71654, *Ex-Cell-O-Corporation* v. *Litton Industrial Products Inc.*

3,716,992, J. F. Stahl, ADAPTOR FOR EXHAUST MANIFOLD, filed Sept. 15, 1975, D.C., E.D. Pa. (Philadelphia), Doc. 75–2603, *Jere F. Stahl* v. *Hooker Industries.*

3,728,137. (See 3,574,070.)

3,766,842. (See 3,682,076.)

3,776,118. (See 3,682,076.)

3,779,144. (See 3,682,076.)

3,810,211. (See 3,682,076.)

3,810,220. (See 3,682,076.)

3,854,809. (See 3,682,076.)

3,859,215, G. A. Milne, SEWAGE TREATMENT SYSTEM, filed July 7, 1975, D.C. Hawaii (Honolulu), Doc. CV–75–0232, *Hanna Enterprises, Inc.* v. *George A. Milne.*

Re. 26,998. (See 3,033,988.)

Re. 27,392. (See 3,353,528.)

Re. 28,054. (See 3,682,076.)

Reg. No. 878,843. (See 3,499,302.)

PATENT NOTICES

Certificates of Correction for the Week of Dec. 23, 1975

R. 28,392	3,878,196	3,897,943	3,905,809
Re. 28,443	3,878,218	3,898,637	3,905,879
Re. 28,520	3,878,579	3,898,914	3,905,910
3,617,472	3,878,656	3,898,928	3,906,134
3,631,161	3,879,339	3,899,230	3,906,338
3,639,411	3,880,656	3,899,532	3,906,382
3,657,011	3,881,855	3,899,534	3,906,513
3,733,150	3,883,107	3,899,598	3,906,701
3,738,940	3,884,763	3,900,182	3,907,054
3,777,908	3,884,902	3,900,349	3,907,076
3,791,887	3,884,988	3,900,485	3,907,158
3,796,910	3,886,767	3,900,515	3,907,160
3,797,678	3,887,087	3,900,601	3,907,211
3,804,340	3,887,198	3,900,630	3,907,299
3,805,401	3,888,621	3,900,763	3,907,431
3,827,048	3,888,896	3,900,902	3,907,481
3,836,502	3,889,137	3,901,077	3,907,533
3,841,497	3,889,494	3,901,150	3,907,548
3,842,169	3,889,504	3,901,522	3,907,566
3,844,992	3,890,144	3,901,585	3,907,691
3,846,483	3,890,287	3,901,678	3,908,099
3,849,278	3,890,384	3,901,691	3,908,190
3,851,068	3,890,432	3,902,202	3,908,340
3,853,525	3,890,492	3,902,422	3,908,765
3,853,716	3,890,605	3,902,474	3,909,189
3,856,124	3,891,366	3,903,065	3,909,320
3,857,780	3,892,107	3,903,147	3,909,420
3,860,567	3,892,521	3,904,439	3,909,569
3,865,008	3,893,988	3,904,581	3,909,706
3,865,187	3,894,084	3,904,640	3,910,873
3,865,606	3,894,941	3,904,660	3,911,188
3,866,110	3,895,744	3,904,664	3,911,629
3,867,271	3,896,105	3,904,817	3,912,086
3,868,699	3,896,373	3,904,835	3,912,119
3,871,598	3,896,670	3,905,229	3,912,265
3,873,846	3,896,926	3,905,368	3,912,302
3,873,877	3,896,935	3,905,369	3,912,388
3,877,165	3,897,491	3,905,552	3,912,808
3,877,554	3,897,502	3,905,732	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 22, 1975

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	2-21-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates: Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-13-74
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Fore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-13-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-6-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-21-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	1-2-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	2-11-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-5-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-13-74
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	7-10-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-25-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	2-26-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-18-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	1-17-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	4-23-75

Expiration of patents: The patents within the range of numbers indicated below expire during December 1975, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,882,205 to 2,866,972 inclusive
Plant Patents..... Numbers 1,775 to 1,791 inclusive

REISSUES

DECEMBER 23, 1975

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

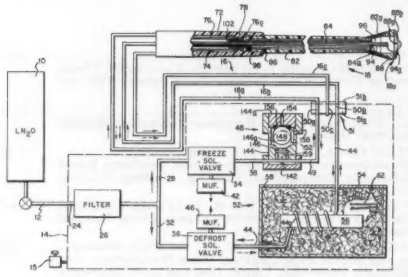
Re. 28,657
CRYOSURGICAL APPARATUS

J. P. Barger, Winchester; William H. Crandell, Lexington, and Thomas W. Gardner, Dearborn Heights, all of Mich., assignors to Dynatech Corporation, Burlington, Mass.

Original No. 3,782,386, dated Jan. 1, 1974, Ser. No. 251,433, May 8, 1972. Application for reissue July 12, 1974, Ser. No. 487,880

Int. Cl.[2] A61B *17/36*

U.S. Cl. 128—303.1 **22 Claims**



19. Cryosurgical apparatus comprising

A. a probe having a hollow thermally conductive tip,

B. a single fluid refrigerant path extending through the tip, said path having a relatively restrictive part communicating with the interior of the tip and a less restrictive part communicating with the interior of the tip,

C. means for flowing refrigerant at a selected temperature above 0°C along said path so that the refrigerant flows along the more restrictive part of the path into the tip and exhausts from the tip along the less restrictive part of the path so that the refrigerant cools the tip to a first temperature sufficiently low to freeze human tissue, and

D. means for subsequently reversing flow of refrigerant so that the refrigerant flows along the less restrictive part of the path into the tip and exhausts from the tip along the more restrictive part of the path so that the refrigerant warms the tip to a second temperature above 0°C.

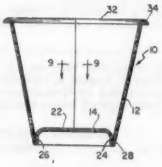
Re. 28,658
INSULATED PLASTIC BUCKET

Gene D. MacDaniel, Lithonia, Ga., assignor to Sweetheart Plastics, Inc., Wilmington, Del.

Original No. 3,664,568, dated May 23, 1972, Ser. No. 879,448, Nov. 24, 1969. Application for reissue Oct. 30, 1973, Ser. No. 410,991

Int. Cl. B65d *3/00, 5/64, 3/10*

U.S. Cl. 229—1.5 B **16 Claims**



1. A container comprising:

a wrapped side wall made from generally rigid foam sheet material having a lapped side seam, defining openings at opposite ends thereof;

a preshaped bottom wall made from generally rigid foam sheet material, said bottom wall having its central portion lying generally perpendicular to the axis of the side wall and an annular shirt extending [away from the general plane of the] *outwardly of said* central portion *into proximity with one end of said side wall*, said skirt defining an outer diameter [slightly] *no* less than the inner diameter of [one of] *the* said opening [s] in said container *at said one end of said side wall* whereby said bottom wall may be fitted snugly into said opening *at said one end of said side wall;*

and a heat-sealed seam joining the skirt to said one end of the side wall.

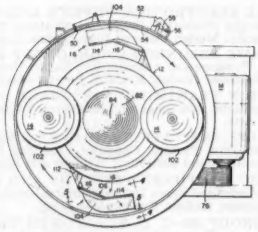
Re. 28,659
SAND-MULLING APPARATUS

Clifford E. Wenninger, deceased, late of Berwyn, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Original No. 3,602,442, dated Aug. 31, 1971, Ser. No. 19,445, Mar. 13, 1970. Continuation of Ser. No. 684,192, Nov. 20, 1967, abandoned. Application for reissue May 17, 1974, Ser. No. 470,751

Int. Cl. B02c *15/00, 23/00*

U.S. Cl. 241—110 **7 Claims**



4. In a mulling apparatus of the type that embodies a bowl adapted to receive therein a predetermined amount of granular material to be mulled and including a bottom wall and an upstanding cylindrical sidewall, a mulling assembly mounted for rotation in one direction about a vertical axis within the bowl and including a hub and a mulling plow construction fixedly connected to and disposed outwards of the hub, arranged below the level of the hub, and adapted for rotation bodily with the hub, said plow construction including a [platelike] *plate-like* sand-scooping lift plow presenting an upper surface which is inclined downwardly and forwardly with respect to the direction of movement of the plow construction and having inner and outer side edges, said outer side edge being disposed in close proximity to said upstanding sidewall of the bowl, a [platelike] *plate-like* wing structure having an outer side face which opposes the inner face of the cylindrical wall of the bowl adjacent to the lower region of the latter, and embodying leading and trailing sections with respect ot the direction of rotation of the mulling assembly, the trailing section extending upwards from the rear region of the inner edge of the lift plow, the leading section of said wing structure extending upwards from the front region of the inner portion of the [left] *lift* plow, being inclined upwardly and inwardly with respect to the bowl bottom, and being disposed for the most part at a greater distance from said sidewall than

the trailing section to the end that it extends at an obtuse angle with respect to said training section, a side plow having its outer end connected to the front portion of said leading section of the wing structure and its inner end fixedly secured to the hub, said side plow lying close to the botton wall of the bowl and extending in a direction which is generally tangential with respect to the hub, whereby the side plow functions in the manner of a deflector for urging the granular material radially outwardly of the bowl and into the path of movement of the leading section of said wing structure, and means for rotating said mulling assembly in said one direction.

Re. 28,660

DISCRIMINATING APPARATUS FOR MOVING TRANSLUCENT SHEETS

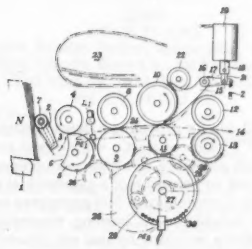
Ronald Sidney Pettet, Portsmouth, England, assignor to De La Rue Instruments Limited, London, England

Original No. 3,731,916, dated May 8, 1973, Ser. No. 148,744, June 1, 1971. Application for reissue Sept. 17, 1973, Ser. No. 397,622

Claims priority, application United Kingdom, June 4, 1970, 26,940/70

Int. Cl.² B65H *7/14*

U.S. Cl. 271—263 **17 Claims**



1. Apparatus for discriminating between moving translucent sheets comprising a sheet transportation means for conveying the sheets in spaced relationship along a flow-line, a single photoelectric detection device positioned on one side of the flow-line and an associated light source positioned on the other side of the flow-line, a first differential amplifier means for producing a first output signal every time the photoelectric detection device detects attenuation of the light source in excess of a first predetermined value and having an input in circuit with the said detection device, and a second differential amplifier means for producing a second output signal every time the photoelectric detection device detects attenuation of the light source in excess of a second different predetermined value greater than said first predetermined value and having an input also in circuit with the said detection device *and means for receiving and utilizing said output signals to discriminate between sheets which produce solely said first output signal and sheets which produce both said first and second output signals.*

Re. 28,661

GOLF SWING TRAINING GLOVE INCLUDING LIGHT PROJECTING DEVICE

Wynn B. Tredway, Sr., P.O. Box 130, Freeport, Pa. 16259

Original No. 3,811,684, dated May 21, 1974, Ser. No. 368,812, June 11, 1973. Application for reissue Jan. 28, 1975, Ser. No. 544,822

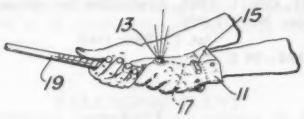
Int. Cl.² A63B *69/36*

U.S. Cl. 273—183 B **5 Claims**

4. The combination comprising:

a. a [golf] glove adapted to be worn on one hand of a person during a training program: and

b. a light [removably] mounted to said glove at the second metacarpal phalangeal joint of said hand and so



constructed and arranged thereon that when a person wearing said glove properly grips a [golf] club-*like device* at *a starting* [the address] position rays from said light impinge upon an adjacent wall at a preselected *initial* spot thereon.

Re. 28,662

QUICK-CHANGE CHUCK WITH ADJUSTABLE TOOL-HOLDING SOCKET

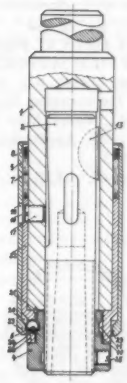
Otto Bilz, Nellingen, and Otto Fauth, Esslingen, both of Germany, assignors to Firma Otto Bilz, Germany

Original No. 3,473,815, dated Oct. 21, 1969, Ser. No. 652,602, July 11, 1967. Application for reissue June 14, 1972, Ser. No. 262,732

Claims priority, application Germany, Apr. 27, 1967, 92267

Int. Cl.² B23B *31/22*

U.S. Cl. 279—75 **8 Claims**



1. A quick-change chuck comprising a cylindrical shank having a tubular wall, a tool socket axially slidable within said shank and adapted to receive a tool, an adjusting nut adapted to be screwed upon the front end of said socket for shifting said socket in its axial direction relative to said shank, said nut having a cylindrical neck portion and a peripheral groove within said neck portion, said groove having outwardly inclined flanks, a plurality of locking balls movable substantially radially into and out of said groove, and a spring-biased control sleeve guiding the radial motion of said balls, and further comprising a guide sleeve fitted over said shank and, in turn, surrounded by said control sleeve, said guide sleeve having on its front end, an annular neck, of a smaller diameter, forming an inner shoulder adapted to abut against the front end of said shank, wherein said balls are disposed.

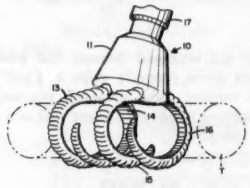
Re. 28,663
FLUID MOTOR AND MATERIAL HANDLING APPARATUS AND THE LIKE UTILIZING SAME

James I. Baer, Lakeland, Fla., assignor to Baka International Marketing Corporation, New York, N.Y.

Original No. 3,343,864, dated Sept. 26, 1967, Ser. No. 493,758, Oct. 7, 1965. Application for reissue Sept. 22, 1969, Ser. No. 871,809

Int. Cl. B66c *1/46*

U.S. Cl. 294—99 R 21 Claims



[1. An apparatus for gripping objects and the like comprising a base member, a pair of tubular members each supported at one end to said base member and normally extending relatively straight, each of said tubular members being closed at its extended end and each comprising a yieldable extendable side wall connected along the edges thereof with a relatively non-extendable side of said member, and means to direct fluid into said tubular members under pressure for causing extension of said extendable walls thereof thereby curving said non-extendable sides facing towards the other whereby said members curve in response to fluid pressure therein toward one another.]

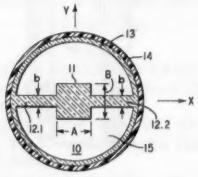
Re. 28,664
SINGLE MATERIAL OPTICAL FIBER STRUCTURES INCLUDING THIN FILM SUPPORTING MEMBERS

Stewart Edward Miller, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Original No. 3,813,141, dated May 28, 1974, Ser. No. 308,833, Nov. 22, 1972. Application for reissue Feb. 3, 1975, Ser. No. 546,293

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 WG 10 Claims



1. An optical fiber structure for waveguiding optical radiation which comprises a filament of a unitary optically transparent structure whose cross section is characterized by a relatively thick [cross section] *cross-sectional* area portion of a fiber optical material at a central portion thereof and by relatively thin cross-sectional area portions of the same material contacting at least two extremities of the central portion, said thin portions *having thicknesses larger than the wavelength of the optical radiation and* providing mechanical support for the central portion, and said thin portions extending in a direction away from the central portion for distances which are at least an order of magnitude larger than the wavelength of the optical radiation, whereby the optical radiation can be propagated in at least one mode through the optical fiber.

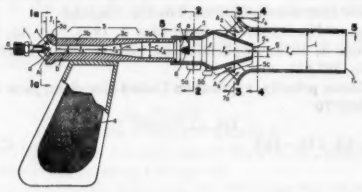
Re. 28,665
HEAT GUN

Dimiter S. Zagoroff, 4 Brigham St., East Boston, Mass. 02128

Original No. 3,779,694, dated Dec. 18, 1973, Ser. No. 197,207, Nov. 10, 1971. Application for reissue Oct. 29, 1974, Ser. No. 518,241

Int. Cl.² F23D *13/12*

U.S. Cl. 431—347 7 Claims



1. A hand held gun for providing a flow of heated air in the 250° F to 1,000° F range against a work object relying upon fuel alone without assistance of blowers or compressors, said gun comprising the combination of a gaseous fuel jet adapted for connection to a conventional fuel gas source such as propane having a stoichiometric burning temperature above 3,000° F, a jet pump activated by said gas jet and having an opening for drawing atmospheric air for combustion into a sub-atmospheric pressure region produced by said jet, said jet pump constructed to impart velocity to said combustion air by mixing, an enlarged pressure recovery passage into which the mixture of gaseous fuel and combustion air proceeds, said recovery passage constructed to convert velocity head of said gases to a pressure head exceeding atmospheric pressure, an internal combustion chamber, said chamber having an entry into which said pressure recovery passage discharges, a flame holding means at said entry and an outlet discharging combustion gases, the effective wetted perimeter of the flow cross-section of said outlet being at least 25 percent greater in length than the perimeter of a single circle of identical cross-sectional area, providing an extended interface between combustion gases discharging from said outlet and atmospheric air, and a temperature-limiting structure extending downstream of said outlet, said structure preventing direct access of the work object to said outlet and to the combustion gases emitting therefrom and defining an ambient air propelling and mixing zone through which said combustion gases flow preceding said work object, said temperature-limiting structure being open to admit atmospheric air freely, progressively to the stream of combustion gases as they proceed through said structure, the respective parts of said gun constructed to burn said fuel in substantially stoichiometric conditions and discharge said combustion gases through said outlet at a temperature exceeding 3,000° F and a velocity in excess of 4,000 feet per minute, said gun, through the cooperation of said extended combustion gas-air interface, effectively producing a flow comprised in major part of ambient air propelled and heated by said combustion gases, the effective length of said temperature-limiting structure downstream of said outlet determining the temperature of the resultant flow at the output end.

PLANT PATENTS

GRANTED DECEMBER 23, 1975

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,818
ROSE PLANT

Dorothy Jean Searles Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed May 10, 1973, Ser. No. 359,094
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a moderately tall, well-shaped bush having upright and well-branched canes; abundant, medium large, dark green foliage; continuous abundant bloom throughout the growing season, with flowers borne mostly singly on strong, long and medium stems; pointed buds of approximately 1¼ inches in length, opening into a large high-centered bloom of regular petal conformation, very double with 50 to 55 petals, and when fully opened, from 4 to 5 inches across the whole bloom; a distinctive color range chiefly in the range of RHS 62B gradually lightening to RHS 62C and 62D and a strong Centifolia fragrance.

3,819
ROSE PLANT

Dorothy Jean Searles Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed May 10, 1973, Ser. No. 359,095
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—19 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a neat upright plant of good vigor and typical hybrid tea habit of growth, good adjustability to a wide range of soil and climatic conditions, medium large, Dark Green foliage which is essentially disease resistant; abundant bloom production throughout the growing season, borne usually singly on long strong stems but also in loose clusters of two or three; oval, pointed buds which open to high-centered blooms that are distinctively regular and well-imbricated, with 40–50 long-lasting petals; a distinctive and stable petal coloration in the bright pink range, the general color effect of the opening bud being slightly redder than RHS 52a, the newly opened bloom RHS 52a, and the bloom three days open, slightly lighter than RHS 52a; and a moderate tea fragrance.

3,820
ROSE PLANT

Dorothy Jean Searles Bailey, Bakersfield, Calif., assignor to San Joaquin Rose Co., McFarland, Calif.

Filed May 10, 1973, Ser. No. 359,097
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—20 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a moderately tall, well-shaped vigorous plant having upright and well-branched canes; abundant, medium large, heavy dark green foliage that has markedly superior resistance to mildew and rust; continuous abundant bloom production from early spring until fall dormancy, with flowers borne single on long stems or two or several on a branch, each on strong, medium long stem; urn-shaped buds of approximately one inch length, of a bright red color, Orient Red 8^{19}, with two or three foliaceous sepals; a high-centered bloom when half-opened, of a bright orange red color, general effect Signal Red $7^{19/1}$; a graceful mature coloration of Geranium Lake 20, shading to Geranium Lake 20/1; a medium sized bloom consisting of from 40 to 50 petals arranged regularly; and a light spicy fragrance.

3,821
KALANCHOE PLANT

Roy N. Pittman, Amarillo, Tex., assignor to J and L Plants, Incorporated, Canyon, Tex.

Filed May 13, 1974, Ser. No. 469,700
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of kalanchoe plant, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of a short, self-branching, upright and compact habit of growth, attractive, flexible foliage of medium size and Fern Green color; an early blooming habit, ranging from about 7 to 10 days earlier than its pollen parent, as well as earlier than most other hybrid varieties; the profusion of its blooms which are borne on short, sturdy flower stems above the foliage; a distinctive and attractive cinnamon flower color when the flowers first open, becoming lighter and more golden, between apricot and burnt orange as the flowers mature; a pleasant and distinctive lemon fragrance of the flowers; an adaptability to photoperiod manipulation for year around flowering; and especial suitability for potted plant use.

3,822
ROSE PLANT

Samuel D. McGredy, P.O. Box 14–100, Panmure, Auckland, New Zealand

Filed Oct. 16, 1974, Ser. No. 514,771
Int. Cl. A01h *3/00*
U.S. Cl. Plt.—12 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as shown and described, characterized particularly by flowers of unique bicolor tonality combining red obverse coloring of the petals with yellow, silver-white and red tones on the reverse and high center, spiral formation of petals that unfurl spirally during the development period and by a plant of tall, upright habit of growth having an abundance of large, leathery, lustrous leaves which are reddish to purple when young and dark green when mature.

3,823
PLUM TREE

Caroline Payne Harris, Bakersfield, Calif., assignor to Plumwood Associates, Bakersfield, Calif.

Filed Dec. 9, 1974, Ser. No. 531,091
Int. Cl. A01h *5/03*
U.S. Cl. Plt.—38 1 Claim

1. A new and distinct variety of plum tree, substantially as illustrated and described, which is vigorous, spreading, dense, round-topped, hardy, freely-suckering, foliated with oblanceolate leaves having an acuminate tip, blooming early with white, uniform flowers borne in small clusters on evenly dispersed spurs, and a productive bearer of large, substantially globose, clingstone fruit having purple skin with a silver-grey bloom, and deep red flesh; the tree being characterized, in addition to its profuse suckering and ease of asexual reproduction from rooted suckers and hardwood cuttings, by bearing fruit—of excellent quality—having a general exterior appearance similar to the Santa Rosa, but ripening a few days later and having distinctive deep red flesh.

PATENTS

GRANTED DECEMBER 23, 1975

ERRATA

For CLASS	See PATENT NO.
052–183	3,927,518
104–148	3,927,735
339–278 C	3,927,841
426–573	3,928,252
427–358	3,928,627
427–387	3,928,629
428–378	3,928,666
235–061.11 E	3,928,827
235–153 AK	3,928,830
340–172.5	3,928,857

NOTE

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PATENTS

GRANTED DECEMBER 23, 1975

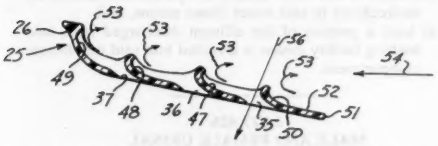
NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,927,421
HELMET VISOR

Alan A. Simon, 1333 N. Martel Ave., Los Angeles, Calif. 90046

Filed Aug. 23, 1974, Ser. No. 500,044
Int. Cl.² A61F 9/04
U.S. Cl. 2—12 12 Claims

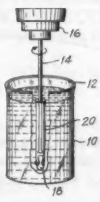


1. A visor for a rigid helmet, said helmet including a smooth crown section having a cavity to receive a head and protect its top, back and sides, a face aperture facing forwardly and opening into the cavity, and a brow surface extending laterally above the face aperture, said visor comprising: an attachment member for attachment to said brow surface; and a shield member integral with, and projecting forwardly from, the attachment member, the shield member, except where contiguous to the attachment member, being bounded by a peripheral edge, a spoiler slot passing through the shield member extending transversely, and being bounded at the lower surface of the shield member by a forward and a rearward slot edge, said slot edges being spaced apart from each other, and a laterally-extending wind deflector surface adjacent to the rearward slot edge at the upper surface of the shield member, said wind deflector surface extending rearwardly and upwardly and terminating in a curl, whereby upwardly and swirlingly to deflect air which flows through the slot and impinges upon it so as to cause an eddying turbulent condition at the confluence of airstreams flowing directly upon the upper surface of the shield member and through the slot upon the wind deflector surface, the slot being formed in a plurality of laterally disposed portions, and a reinforcement rib between each pair of said portions extending between and interconnecting the forward and rearward edges of the slot.

3,927,422
PROSTHESIS AND METHOD FOR MAKING SAME

Philip Nicholas Sawyer, 603 Third St., Brooklyn, N.Y. 11215

Filed Dec. 12, 1973, Ser. No. 424,062
Int. Cl.² A61F 01/24
U.S. Cl. 3—1 13 Claims

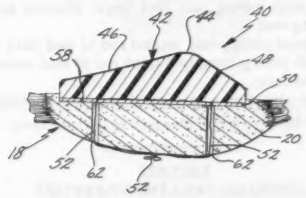


1. A method of improving the performance of a graft prosthesis comprising making the prosthesis of collagen and increasing the negative surface charge of the intimal surface thereof by a succinylation reaction.

3,927,423
PATELLAR IMPLANT AND METHOD

Alfred B. Swanson, 2949 Bonnell S.E., Grand Rapids, Mich. 49506

Filed June 7, 1974, Ser. No. 477,260
Int. Cl.² A61F 1/24
U.S. Cl. 3—1.91 12 Claims

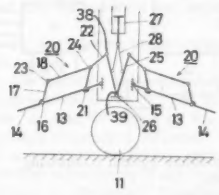


1. A surgically implantable prosthesis for replacing the underlying cartilage on the posterior surface of the patella, the posterior surface of the patella having a recess provided therein, said prosthesis comprising: a body of flexible inert material, said body having a first compound articular surface corresponding generally to that of the posterior surface of a normal patella for gliding engagement with the femoral condyles; a second surface of said body opposite saaid first surface being adapted for positioning in the recess formed in the posterior surface of the patella; and means for securing said body in the recess.

3,927,424
MECHANICAL HAND

Hideyo Itoh, Tokyo, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 21, 1974, Ser. No. 435,214
Claims priority, application Japan, Jan. 19, 1973, 48-8431
Int. Cl.² A61F 1/06
U.S. Cl. 3—12.6 6 Claims



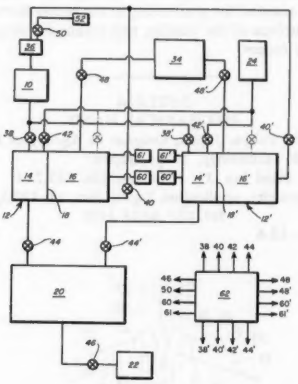
1. A mechanical hand comprising:
a first free rotation joint;
a second free rotation joint;
a third free rotation joint;
a fourth free rotation joint;
a fifth free rotation joint;
a sixth free rotation joint;
a seventh free rotation joint;
a first rod;
a second rod;
a third rod;
a projecting rod;

a projecting bar;
a first finger element;
a second finger element;
a first stationary surface;
a second stationary surface;
said second finger element and said projecting bar being rigidly joined at a predetermined angle;
said first joint joining said first finger element to said first stationary surface;
said second joint joining said first finger element to the junction of said second finger element and said projecting bar;
said third joint joining said first rod and said projecting bar;
said fourth joint joining said second rod, said first rod and said projecting rod;
said fifth joint joining said first finger element and said projecting rod;
said sixth joint joining said second rod to said third rod;
said seventh joint joining said third rod to said second stationary surface;
whereby an object may be gripped upon the application of pressure to said third rod.

3,927,425
SEWERAGE TREATMENT SYSTEM

R. Edward Delaney, New Britain, and Alan H. Cornish, Newington, both of Conn., assignors to Koehler-Dayton, Inc., New Britain, Conn.

Continuation of Ser. No. 304,760, Nov. 8, 1972, Pat. No. 3,815,159. This application Apr. 22, 1974, Ser. No. 462,945The portion of the term of this patent subsequent to June 11, 1991, has been disclaimed.
Int. Cl.² E03D *5/14*
U.S. Cl. 4—10 **8 Claims**



1. A sewerage treatment system comprising
water closet means,
bathing facility means,
first and second filtrate compartments,
means including filtering media for selectively directing at least a portion of the liquid component of the effluent flushed from said water closet means into either of said first or second filtrate compartments,
means for selectively directing at least a portion of the effluent discharge from said bathing facility means into either of said first or second filtrate compartments,
means for selectively recirculating the liquid in either of said first or second filtrate compartments to said water closet means for flushing same,
means for operating the system in a first mode of operation wherein
at least a portion of the liquid component of the effluent flushed from said water closet means is directed into one of said filtrate compartments,
the liquid in said one filtrate compartment is selectively recirculated to said water closet means, and
at least a portion of the effluent discharged from said bathing facility means is directed into the other one of said filtrate compartments, and
means for alternately operating the system in a second mode of operation wherein
at least a portion of the liquid component of the effluent flushed from said water closet means is directed into the other filtrate compartment,
the liquid in said other filtrate compartment is selectively recirculated to said water closet means, and
at least a portion of the effluent discharged from said bathing facility means is directed into said one filtrate compartment.

3,927,426
MALE AND FEMALE URINAL

Paul E. Geddes, Sturgis, Mich., assignor to GNP Plastics Corporation, Grand Rapids, Mich.

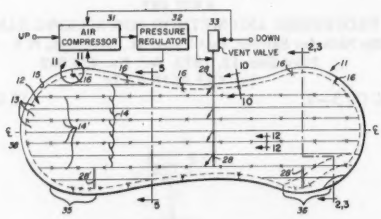
Filed Mar. 3, 1975, Ser. No. 554,639
Int. Cl.² E03D *13/00*
U.S. Cl. 4—110 **10 Claims**

1. A plastic blow molded container adapted as a urinal including a body, a neck extending from the body and tapering to a smaller cross section at one end thereof and formed inclinedly to the body of said container, an elongated handle formed integrally with said neck and separated therefrom by an integral sealed portion, a smaller diameter end of said neck forming the terminous of said neck, and replaceable adapter means for one or the other of female and male usage and including a portion adapted to form a press fitting connection with the end of said neck, and a hinged closure means proportioned to fit into and form a seal over the open end of said adapter means whereby the interior of the urinal is sealed.

3,927,427
SWIMMING POOL COVER

Harry Eugene Aine, 1804 Stierlin Road, Mountain View, Calif. 94040

Continuation-in-part of Ser. No. 367,198, June 5, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,204
Int. Cl.² E04H *3/16, 3/19, 3/18*
U.S. Cl. 4—172.14 **27 Claims**



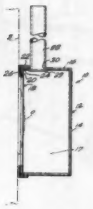
1. In a swimming pool cover:
cover means for floatation in a swimming pool, said cover means being bendable and having positive buoyancy relative to the pool water when in use for overlaying a region of the pool;
sinking means operatively coupled to said cover means for selectively sinking within the pool liquid, when actuated, a selectively sinkable portion of said cover to a lower level than other portions of said cover means which have a positive buoyancy to cause said cover means to bend

and thus to be folded within the pool, thereby opening a region of the pool for swimming.

3,927,428
ADJUSTABLE BATHTUB OVERFLOW LIQUID CONTROL

Emile Jette, 1328 N.E. 110 Terrace, Miami, Fla. 33161, and Maxwell Guldin, 8361 Allison Road, Miami Beach, Fla. 33141

Filed June 26, 1975, Ser. No. 590,613
Int. Cl.² E03C *1/244*
U.S. Cl. 4—206 **6 Claims**



1. An adjustable bathtub overflow liquid control comprising:

an adapter comprising a ring sized to fit about the drain opening of a conventional bathtub overflow drain and including a smooth surface and including means for attachment of the smooth surface of the adapter to the bathtub surface; and

a housing including means connecting the housing to the ring adapter, said housing and ring adapter being effective to block liquid flow through the drain opening, and said housing including an opening to permit fluid to flow through the opening and out the drain opening,

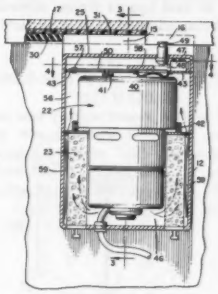
a snorkle tube having a first end and a second end, said first end being snugly received in the opening and said second end being spaced from said first end and being open to permit water to flow through the snorkle tube and housing.

3,927,429
TOILET DEODORIZING ACCESSORY INCLUDING LEAK PROOF CONNECTION

Raymond H. Pearson, 627 Sherwood Drive, Richardson, Tex. 75080

Filed Jan. 18, 1974, Ser. No. 434,519
Int. Cl. E03d *9/05, 9/04;* **A47k** *3/22*
U.S. Cl. 4—213 **1 Claim**

1. A ventilator accessary for toilets, said accessary comprising the combination of a multi-layer seal between the water tank and the water tank cover of said toilet, a hollow flat nozzle located within a gap in said seal, and an electrically driven suction means in communication with said nozzle whereby elimination odors may be drawn through the water distribution channel and overflow pipe of said toilet in seriatim with said nozzle and blower, said multi-layer seal comprised of a relatively firm lower portion contacting the top rim of said water tank and having a gap so as to receive said nozzle, and a relatively compressible upper portion contacting

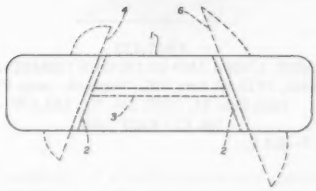


the inner periphery of said water tank cover and also contacting the lower portion of said seal or integral therewith.

3,927,430
PATIENT SELF-TRANSPORTER

Ira R. Allen, 4521 S. Dogwood Place, Tucson, Ariz. 85704

Filed Nov. 26, 1973, Ser. No. 419,125
Int. Cl. A47b *83/04*
U.S. Cl. 5—81 R **1 Claim**



1. A patient self-transfer device comprising:

a. a rigid, planar surface structure to support the surface thereof in a horizontal plane between two juxtaposed objects such as bed and wheelchair;

b. two downhanging members each of which is attached rigidly and normal to the supporting surface structure, said members being arranged to contact said objects to secure the structure in position for self-transfer of a patient over said surface from one object to the other object;

c. wherein the width of the planar surface is equal to one-fourth its length;

d. wherein the included angle between the planes of the downhanging members is 40°, and the angle formed on either side of said 40° angle by the major axis of the planar surface structure is 70°; and

e. wherein a compression strut is secured to the middle lower portions respectively of the downhanging members therebetween to strengthen the structure because the forces against the outside faces of said members force them inwardly.

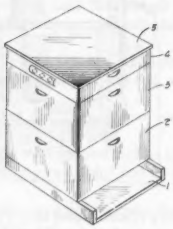
3,927,431
VENTILATING SPACER FOR BEEHIVE

Henry L. Wallace, 214 E. Main St., West Union, Ohio 45603

Filed Apr. 13, 1973, Ser. No. 350,758
Int. Cl.² A01K *47/00*
U.S. Cl. 6—1 **9 Claims**

1. A ventilating spacer for a beehive having a plurality of vertically stacked supers defining upstanding sidewalls and a shallow, flat cover defining a roof for the hive, and having

flanges extending downwardly, outwardly of daid sidewalls, respectively, said spacer comprising a respectively, said spacer comprising a relatively shallow, rectangular spacer frame of four sidewalls, open both at the top and bottom, and unobstructed within its said spacer frame sidewalls, said spacer frame sidewalls being adapted to be in vertical alignment with



said upstanding sidewalls of said supers and within said flanges of said cover and being further adapted to be removably disposed intermediate the said uppermost super and said cover and in sealing relationship with said upstanding sidewalls and said spacing frame having oppositely disposed ventilation openings selectively permeable to insects smaller than honey bees and bee moths.

3,927,432

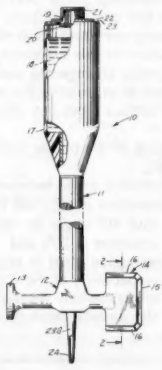
HAMMER, KNIFE AND GLUE GUN COMBINATION

Leif B. Dahl, 3123 49 Ave., NE., Portland, Oreg. 97213

Filed Feb. 24, 1975, Ser. No. 552,139

Int. Cl.² B25F *1/00*

U.S. Cl. 7—8.1 R **3 Claims**



1. A hammer, knife, and glue gun combination device, comprising a metal handle, a head with a flanged portion and a knife portion secured to said handle, a nozzle extending from said head and a squeeze bottle secured to said handle having removable cap means.

3,927,433

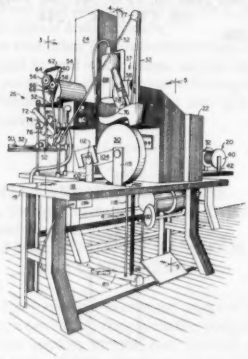
WELT APPLICATION PROCESS FOR UNIT SOLES AND WEDGE PLATFORMS

John DeCoulos, Peabody, Mass., assignor to Boston Machine Works Company, Lynn, Mass.

Division of Ser. No. 374,508, June 28, 1973, Pat. No. 3,824,643. This application Apr. 8, 1974, Ser. No. 458,903

Int. Cl.² A43D *9/00*

U.S. Cl. 12—142 D **1 Claim**



1. A process for applying welting to a variable thickness shoe component, said process comprising the steps of advancing from a supply spool a length of said welting, applying cement to a surface of said welting, drying said cement on said surface to provide a coating, metering predetermined increments of said welting, feeding said welting together with said shoe component between a drive wheel and an adaptor wheel defining a nip therebetween with said shoe component in contact with said adaptor wheel and said welt in contact with said drive wheel, heat activating portions of said coating as said welting advances in said nip, severing said welting at said nip, the diameter of said drive wheel being less than one-tenth the diameter of said adaptor wheel, and accomodating the distance between said adaptor wheel and said drive wheel to the varying combined thickness of said shoe component and said welt as they pass through said nip without jamming.

3,927,434

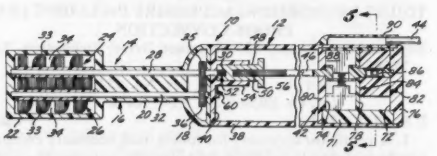
WATER POWDERED ROTARY BRUSH

Fred M. Burgess, P.O. Box 70, San Fernando, Calif. 91340

Filed May 14, 1973, Ser. No. 360,048

Int. Cl.² A46B *13/06*

U.S. Cl. 15—24 **7 Claims**



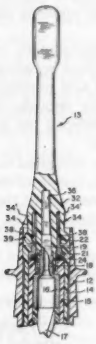
1. A water powered rotary brush which comprises housing means; a pair of generally cylindrical brushes rotatably mounted in said housing means in a generally parallel array with one side of the brush pair exposed outside of said housing means and the other side of the brush pair recessed in said housing means; drive means in said housing means, said drive means including a fluid motor having fluid inlet and outlet

conduit means, and drive connection means from said fluid motor to said brushes arranged to drive said brushes in opposite directions of rotation so that the exposed portions of said brushes move toward each other; and drive control means associated with said drive means for selectively actuating said drive means between on and off drive conditions, said drive control means comprising clutch means in said drive connection.

3,927,435
TOOTHBRUSH STEM ATTACHMENT

Michel A. Moret, and Jean-Pierre Musy, both of Geneva, Switzerland, assignors to Les Produits Associes, SA, Geneva, Switzerland

Filed Dec. 20, 1972, Ser. No. 316,980
Int. Cl.² A46B *13/02*
U.S. Cl. 15—176 **3 Claims**



1. A toothbrush stem attachment adapted to be attached to and driven by a hand appliance having an opening for receiving said toothbrush stem and an annular projection for retaining the toothbrush stem to said appliance, which attachment comprises

a. a molded stem having an integral coupling at the rear end thereof and laterally-extending bristles forming a brush at the front end thereof,

b. said coupling including a flared section flaring three-dimensionally outwardly and rearwardly, a driving socket section extending rearwardly beyond said flared section, and a pair of narrow longitudinally-extending resilient cantilever detent fingers radially spaced from the socket section and terminating between the rearward ends of the flared and socket sections,

c. said socket section having a rotationally symmetrical exterior surface and an interior surface which is cylindrical at the open end thereof and is of non-circular cross-section deeper in the socket,

d. a portion of said flared section overlapping a portion of said socket section in spaced relationship therewith and the inside of the socket section extending into the stem beyond the region of said overlapping,

e. said resilient fingers being on opposite sides of the stem with the fixed ends of the fingers integral with said flared section and forward of the rear end of the flared section,

f. the sides of said fingers being spaced from the adjacent portions of the flared section,

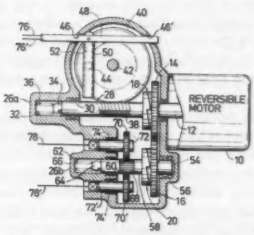
g. the free ends of said fingers having respective detent grooves on the inside thereof which are curved in arcs which are rotationally symmetrical about the axis of said socket section, said fingers being adapted to extend over said annular projection, and

h. the free ends of said fingers having respective outward projections opposite said detent grooves with the outer faces curved in arcs which are rotationally symmetrical about the axis of said socket section.

3,927,436
MULTIPLE-SHAFT DOUBLE-MOTION DRIVE MECHANISM

Naohiko Inoue, and Youichi Moori, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., and Jidosha Denki Kogyo Kabushika Kaisha, both of Yokohama, Japan

Filed Feb. 15, 1974, Ser. No. 442,824
Claims priority, application Japan, Feb. 19, 1973, 48-19209
Int. Cl.² B60S *1/08, 1/20, 1/44*
U.S. Cl. 15—250.17 **8 Claims**

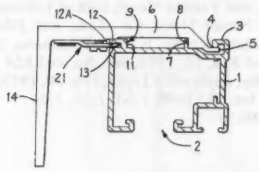


1. A combination of a double-motion drive mechanism and a wiper assembly for a lamp of a lighting device, in which said drive mechanism comprises a reversible motor having an output shaft rotatable in first and second directions depending upon the polarity of a current energizing the motor, a first gear rotatable with the output shaft of the motor, a second gear in mesh with the first gear, first power output means to be driven by said first gear for producing a power output in the form of a linear reciprocating motion, second power output means to be driven by said second gear for producing a power output in the form of a rotary motion, a first one-way clutch connected between said first gear and said first power output means for transmitting to the first power output means the rotation of the output shaft of the motor in said first direction, and a second one-way clutch connected between said second gear and said second power output means for transmitting to the second power output means the rotation of the output shaft of the motor in said second direction and in which said wiper assembly comprises a wiper arm pivotally movable over said lamp between an operative position having its leading end located substantially over a center of the lamp and an inoperative position away from the lamp, a blade carrying arm carrying thereon a wiper arm and connected at one end to said wiper arm and rotatable about said leading end of the wiper arm, a first flexible line connected at one end to said first power output means of the drive mechanism and at the other end to said wiper arm for moving the wiper arm between said operative and inoperative positions as said first power output means produces said linear reciprocating motion, and a second flexible line which is connected at one end to said second power output means of the drive mechanism and at the other end to said blade carrying arm for driving the blade carrying arm to rotate about said leading end of the wiper arm as said second power output means produce said rotary motion.

3,927,437
POSITIVELY SUPPORTED CAM FOR ENGAGING A TRAVERSE ROD

James A. Ford, Sherman Township, St. Joseph County, Mich., assignor to Kirsch Company, Sturgis, Mich.

Filed Feb. 14, 1974, Ser. No. 442,378
Int. Cl.² A47H 1/04
U.S. Cl. 16—94 R 11 Claims



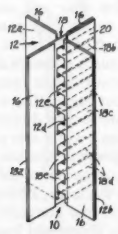
1. In combination with a bracket having a rod receiving surface and a traverse rod having a rod portion defining thereon a clamping surface which is substantially parallel with and facing in the same direction as said receiving surface when the rod is in an installed position thereagainst, said clamping surface being spaced from said receiving surface, a fastening clip comprising:

a pivoting portion including means for pivoting said clip to said bracket at a point spaced from the traverse rod, and a holding portion which is substantially parallel to said receiving surface but spaced therefrom for engaging said clamping surface when the rod portion is positioned between said receiving surface and said holding portion; an opening through said holding portion of said clip, and threaded means extending through said opening and threadably engaged with said bracket for causing the holding portion of said clip to bear against said clamping surface for urging said rod snugly against said receiving surface, said threaded means being independent of and spaced from said pivoting means.

3,927,438
FLEXIBLE TAPE FASTENER OR HINGE

Melvyn Blake, Framingham, Mass., assignor to Norton Company, Worcester, Mass.

Filed Nov. 22, 1974, Ser. No. 526,103
Int. Cl.² E05D 7/00
U.S. Cl. 16—150 7 Claims



1. A flexible tape having an X-like configuration, in cross section, a central axis and four legs providing a longitudinally continuous structure adapted to extend along, be secured to and join a plurality of adjacent members together so that the central axis of the X-like configuration coincides generally with a juncture formed by the members to be joined, comprising:

a first flexible perforated strip of predetermined width forming a first half of the X having

opposite side edges,

opposite side portions adjacent the side edges forming first and second legs of the X and adapted to be fastened to the members to be joined,

a central portion between the opposite side portions and through which the central axis of the X passes,

a plurality of apertures in the central portion spaced longitudinally along the central axis, a plurality of longitudinally spaced connecting portions between the apertures in the central portion integral with and connecting the opposite side portions;

a second slotted flexible strip of predetermined width forming a second half of the X having

opposite side edges,

opposite side portions adjacent the side edges forming third and fourth legs of the X, and adapted to be fastened to the members to be joined,

a plurality of longitudinally spaced elongated slots in one of the opposite side portions of the second strip extending inwardly a predetermined distance from one of the side edges interrupted by entrances to the slots to the other one of the opposite side portions of the second strip,

a plurality of longitudinally spaced elongated integral connecting portions between the slots in a slotted one of the opposite side portions and extending from the other one of the opposite side portions through the apertures and beyond the central portion in the first perforated strip;

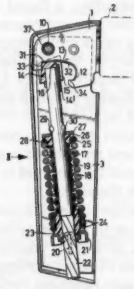
a continuous flexible elongated backing strip of a transverse width less than the length of the slots adhesively secured to at least one side face of the slotted side portion and elongated connecting portions therein,

whereby the first and second flexible strips are locked and hingedly connected together in an intermeshing and crossing relationship to form the continuous X-like tape structure.

3,927,439
HINGE

Wilhelm Gronbach, Dr. Fritz Huber-Strasse No. 73, 8090 Wasserburg, Germany

Filed Feb. 20, 1974, Ser. No. 444,116
Claims priority, application Germany, Feb. 20, 1973, 2308361; Apr. 6, 1973, 2317397; May 7, 1973, 2322967
Int. Cl.² A47H 15/00
U.S. Cl. 16—190 8 Claims



1. A hinge adapted to balance covers or flaps or refrigerating chests, comprising:

a stationary leaf hinge member;

a movable leaf hinge member pivotally mounted on said stationary leaf hinge member;

a bearing surface on one of said hinge members displaced from the pivotal axis of said leaf hinge members;

a bearing element mounted on the other of said hinge members and riding on said bearing surface;

a guiding-rod having an abutment stop means thereon;

first means pivotally mounting one end of said guiding-rod on the stationary leaf hinge member and including nut means fixed to said stationary leaf hinge member with said one end of the rod being rotatably engaged with said nut means;

second means connecting the other end of said guiding-rod to said bearing element so that, upon opening or closing said hinge, said bearing element, in following said bearing surface, causes said guiding-rod to move axially through said nut means while pivoting about said one end of said guiding-rod;

a pre-stressed compression spring mounted on said guiding-rod and bearing on one end against said abutment stop means and on the other end against said nut means imposing an axial force on said guiding-rod;

said guiding-rod and said nut means defining mutually co-acting means for braking movement of said guiding-rod during opening and closing of said hinge comprising a first set of coarse pitch screw threads defined on the outer periphery of the one end of said guiding-rod, and a second set of coarse pitch screw threads defined on the internal surface of said nut means, said sets being complementary and of the type having a helix angle in the order of 20° and being threadedly engaged forcing said guiding-rod to undergo a rotational braking movement when moving through said nut means.

3,927,440

METHOD OF EVISCERATING ANIMALS AND FOWL

Millard S. Sindler, 3701 Twin Lakes Court, Randallstown, Md. 21133, and Russell Sindler, 2413 Hal Circle, Pikesville, Md. 21209

Division of Ser. No. 242,341, April 10, 1972, abandoned. This application Oct. 10, 1973, Ser. No. 404,998

Int. Cl.² A22C *25/18*

U.S. Cl. 17—52 **1 Claim**

1. A method of extracting the vertebrae and viscera from fowl wherein the viscera is attached to the cavity lining of the fowl adjacent the vertebrae, comprising, the steps of forming an opening in the fowl and the cavity lining in the vicinity of the cloaca, extending means for supporting the cavity lining along the inner surface of the lining adjacent each side of the vertebrae, moving a cutting blade over the outside surface of the fowl along each side of the vertebrae through the length of the fowl and to the depth of the lining support, thereby severing the vertebrae and a portion of the cavity lining to which the viscera is attached from the remainder of the fowl.

3,927,441

ROPE STRETCHER PROVIDED WITH IMPROVED UNCLAMPING DEVICE

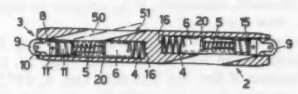
Renato Anzini, Minusio, Switzerland, assignor to Ampaglas S.p.A., Italy

Filed Feb. 26, 1974, Ser. No. 445,979

Claims priority, application Italy, Feb. 26, 1973, 20832/73

Int. Cl.² F16G *11/00*

U.S. Cl. 24—136 **4 Claims**



1. A rope stretcher for clamping cables comprising: a casing having a bore and a cable clamping passage defined therein in intersecting relation; a plunger including a rod extending longitudinally in said bore; a clamping member rotatably mounted at a first end of said plunger closest to the intersection of said bore and said passage; and a first spring positioned to bias said plunger in said bore toward said intersection of said bore and said passage; said rope stretcher being characterized by:

a short annular cylinder slidably encircling a portion of said plunger rod;

stop means adjacent said first end of said plunger for preventing said cylinder from sliding beyond said first end;

shoulder means on said plunger rod at a location spaced from said first end;

auxiliary spring means encircling said plunger rod between said cylinder and said shoulder means for biasing said cylinder toward said first end of said plunger; and

actuating means for selectively displacing said cylinder along said plunger rod against the bias of said auxiliary spring means.

3,927,442

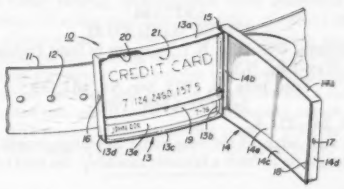
CLOTHING BELT BUCKLES

James W. Foster, 1267 2nd St., Sarasota, Fla. 33577

Filed Nov. 5, 1974, Ser. No. 520,933

Int. Cl.² A44B *11/00*; **A41D** *25/04*

U.S. Cl. 24—163 K **1 Claim**



1. A buckle for a belt comprising: a body comprising a rear wall surface, a plurality of side walls integrally formed with said rear wall and depending therefrom to form a receptacle for credit cards and the like, adjacent ends of said side walls joined one to the other to form a continuous wall for said receptacle, one of said side walls having at least one recess therein to expose a portion of the volume of the receptacle whereby credit cards and the like stored in said receptacle may be readily removed; a narrow strap joining two opposing ones of said depending side walls to partially enclose said receptacle and spaced apart from the remaining opposing walls, which remaining walls include said wall having at least

one recess therein, whereby credit cards and the like are securely retained but easily removable from said receptacle; and a cover formed complementary to said body to fully cover said receptacle and said depending walls, hinge means connecting said body and said cover, a strap depending from said body and adapted to engage a looped end of a belt and a hook depending from said body and adapted to engage perforations in said belt.

3,927,443

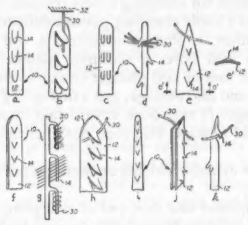
MULTI-ELEMENT SELF-GRIPPING DEVICES WITH LINGUIFORM GRIPPING TABS

George C. Brumlik, Montclair, N.J., assignor to Ingrip Fasteners, Inc., New York, N.Y.

Continuation-in-part of Ser. Nos. 171,701, Aug. 13, 1971, abandoned, and Ser. No. 171,668, Aug. 13, 1971, Continuation of Ser. No. 295,637, Oct. 6, 1972. This application Sept. 10, 1973, Ser. No. 395,781

Int. Cl. A44b *17/00*

U.S. Cl. 24—204 **16 Claims**



1. Self-gripping device comprising a multiplicity of upright gripping elements stiffly attached to and distributed in all directions over a base, each of said gripping elements comprising elongated member having a flat longitudinal face section, said flat section having a plurality of integral linguiform tabs struck out from within the periphery and spaced from the edges thereof thereby forming openings in said member, said tabs and said openings forming substantially V-shaped configurations between the edge of the tabs and the edge of the openings, said tabs being bent out so as to be downwardly inclined relative to said base, said gripping elements being adapted to penetrate and become lodged in a fibrous receiving material.

3,927,444

SPRING WING STUD

Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed June 24, 1974, Ser. No. 482,139

Int. Cl.² A44B *17/00*

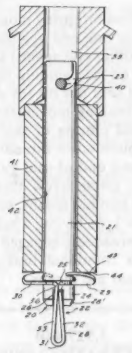
U.S. Cl. 24—221 K **6 Claims**

1. A stud adapted for removable interengagement with a rigid receptacle to form a fastener assembly, the stud comprising:

an elongated body member with an enlarged head on one end;

a gripping surface on the head to facilitate gripping and rotation of the stud;

said stud having a spiral cam slot terminating in a locking detent thereon and the receptacle being adapted to receive the stud, said receptacle having at least one laterally extending cam follower so that when the stud and receptacle are positioned and brought into interengagement, the cam slot will be aligned with each cam follower whereupon relative rotation between the stud and receptacle will cause the cam follower to enter the cam slot until seated in the locking detent with the assistance of the spring permitting axial movement of the stud with respect to the rigid receptacle adapted to receive the stud thereby locking the two members together, and relative rotation between the stud and receptacle in the opposite direction will move each cam follower from the locking detent and along the cam slot until disengagement occurs whereupon the stud and receptacle can be separated and the two members released with the assistance of the spring permitting axial movement and removal of the stud with respect to the rigid receptacle adapted to receive the stud; and the head including a slot diametrically across the head end of the stud, and annular groove adjacent the



slotted head end of the stud and spaced from the slot, a wing portion with an end thereof positioned in the slot of the head and the sides extending axially and laterally therefrom so as to form an enlarged gripping surface for the stud, a helical projection extending from each side of the wing portion and around opposing circumferential portions of the stud, a portion of each projection located in the annular groove, and the free end of each opposing projection positioned along the axial length of the stud spaced from the groove and slot so as to form a resilient spring-like engaging surface on the underside of the head of the stud.

3,927,445

REFUSE BAG RETAINER

Allen T. Pavlish, 6574 Annandale Road, Mayfield Heights, Ohio 44124

Filed Feb. 21, 1974, Ser. No. 444,499

Int. Cl.² B65B *67/12*

U.S. Cl. 24—243 K **8 Claims**

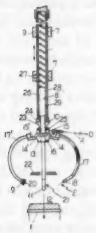
1. An adjustable loop retainer comprising an elongated flexible member formed into a loop, a handle of substantial size for easy grasping connected to said loop, and an adjustable sleeve member having a through opening and material engaging means disposed around one axially directed end thereof and projecting generally in the axial direction, wherein the improvement comprises, said loop being disposed through said sleeve from the end thereof opposite said material engaging means whereby said material engaging means are directed toward the portion of the loop to be adjusted; said material

engaging means being comprised of pointed projections extending from an end of said sleeve and angled slightly toward the axis of said sleeve member; and said flexible member comprising thin flat elastic material in strip form having a width greater than the through opening in said sleeve whereby at any adjusted position of said sleeve member, spreading said loop to engage an object causes said material engaging means to engage said elastic material at opposite sides of said one end of said sleeve and retain said loop at its adjusted size.

3,927,446
LEA MAKING APPARATUS

Tomokiyo Baba, 117, Yagisawa, Ohaza, Ueda, Nagano, Japan

Division of Ser. No. 395,843, Sept. 10, 1973. This application July 26, 1974, Ser. No. 492,148
Int. Cl.² B65H *54/62*
U.S. Cl. 28—21 **1 Claim**



1. An apparatus for tying threads comprising:
a tubular body having a bent portion and an open end,
a hollow box supporting an axially rotatable base portion of said tubular body, a rotating mechanism to which the base portion of said tubular body is connected; said base portion of said tubular body being inserted into said box and provided with an air hole, and
a suction pipe open within said box and connected to said open end of said tubular body through said hollow box and said air hole,
whereby when said threads having free ends are hooked and the tubular body is rotated, the threads are wound around the bent portion, while the free ends of the threads are sucked into said open end of said bent portion before the tubular body completes one revolution.

3,927,447
TIRE RASP

Karl Willinger, Vienna, Austria, assignor to Firma Hans Ehgartner, Vienna, Austria

Filed Oct. 3, 1974, Ser. No. 511,619
Claims priority, application Austria, Oct. 5, 1973, 8525/73; Mar. 18, 1974, 2203/74; Mar. 18, 1974, 2204/74; May 10, 1974, 3890/74
Int. Cl.² B23D *71/00, 1/00*
U.S. Cl. 29—79 **28 Claims**

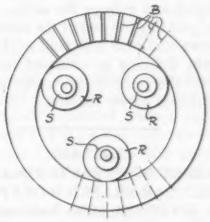
1. A tire rasp comprising a generally cylindrical body with a pair of end disks and a multiplicity of sheet-metal blades sandwiched between said disks, each of said blades having at least one toothed side circularly curved with a common radius substantially equaling that of said disks, said blades adjoining each other with said toothed sides thereof centered on the axis of said body to define part of a peripheral cutting surface; the teeth of said blades being each bounded by four concave arcuate edges meeting at three sharp points including a middle

point and two flanking points, said middle point projecting radially beyond said flanking points.

3,927,448
PELLETIZING MACHINES

Herbert Jones, and Michael Thomas Dorn, both of Gloucester, England, assignors to Simon-Barron Limited, Gloucester, England

Filed Nov. 22, 1974, Ser. No. 526,241
Claims priority, application United Kingdom, Dec. 20, 1973, 59265/73
Int. Cl.² B21B *13/02*
U.S. Cl. 29—116 R **11 Claims**



1. A pelletizing roller of the kind referred to and comprised by a roller shell, mounted on a shaft by means of two axially spaced roller bearing arrangements each comprised of an inner race, an outer race and a plurality of rollers therebetween, characterized by the provision of spacing means located between said bearing arrangements, said spacing means comprising a groove on the interior surface of said roller shell at a position between said bearing arrangements, a complete ring divided into plural parts circumferentially seated in said groove, and means holding said ring parts in position in said groove when the pelletizing roller is fully assembled.

3,927,449
FORMED ONE-PIECE HOLLOW ROLLER SHAFT

Lawrence W. Gibble, and Dennis Lee Keesey, both of York, Pa., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 3, 1973, Ser. No. 421,120
Int. Cl.² B21H *1/14*; B21K *1/02*
U.S. Cl. 29—148.4 D **18 Claims**

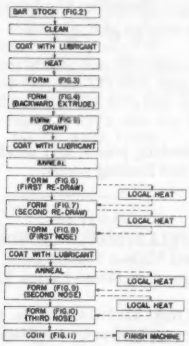
1. A method of manufacturing a member in the form of a generally cylindrical roller having an enlarged generally cylindrical center portion defining a first diameter, and necked down end portions extending from opposite ends of said center portion, said end portions each being of generally cylindrical configuration and defining a second diameter smaller than said first diameter, and further defining an internal cavity, and

relatively thick walls between the cavity and the roller exterior comprising in sequence the steps of:

a. providing a blank,

b. heating the blank, and

c. forming the blank by pressing it in a die into a preform shape having an enlarged center portion, a first necked down end portion, and a cavity in the blank opposite said first necked down end portion,



d. further forming by pressing to elongate the enlarged center portion and enlarge the cavity,

e. forming by pressing the end of the blank opposite the first necked down end into a second necked down end portion, thereby defining an enlarged central body portion intermediate the necked down end portions having an enlarged internal cavity therein.

3,927,450

METHOD OF MANUFACTURING HOLLOW, CIRCULAR-SHAPED WORKPIECES

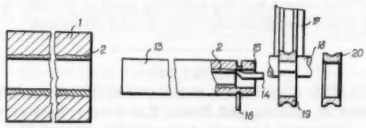
Karel Sommer; Jiri Zdrazil; Milan Kubinek, all of Brno; Jaroslim Bahna, Illava; Stanislav Kyselica, Trencianska Tepla; Frantisek Habrovec, and Jiri Skarek, both of Brno, all of Czechoslovakia, assignors to ZKL Zavody na valiva loziska a traktory, narodni podnik, Brno, Czechoslovakia

Filed Aug. 1, 1974, Ser. No. 493,752

Claims priority, application Czechoslovakia, Dec. 4, 1973, 8331-73

Int. Cl.² B21D *53/12*; B21H *1/12*

U.S. Cl. 29—148.4 R **18 Claims**



1. A method of manufacture of hollow, circular-shaped workpieces, comprising centrifugally casting hollow ingots from a bearing steel, reducing the ingot to form a tube, dividing the tube into sections, profile-forming the sections, then machining the formed sections by metal cutting methods, subsequently heat-treating the machined formed sections to obtain optimum hardness, and after tempering finishing the product by at least one of the steps of grinding, superfinishing, lapping and polishing.

3,927,451

METHODS OF FITTING FLUID PRESSURE OPERATED DEVICES INTO PIPELINES

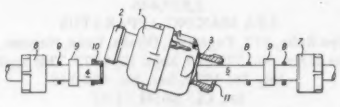
Ivor Thomas Rogers, Luton, England, assignor to George Kent, Limited, Luton, England

Filed June 24, 1974, Ser. No. 481,986

Claims priority, application United Kingdom, July 5, 1973, 32193/73

Int. Cl.² B21D *39/03*

U.S. Cl. 29—157 R **3 Claims**



1. The method of fitting a fluid pressure operated device into a pipeline the device having coaxial inlet and outlet connections of substantially larger internal diameter than the external diameter of the pipeline, which comprises the steps of removing a straight section of the pipeline of length less than the overall length of the fluid pressure device to afford spaced coaxial pipeline ends between which the device is to be fitted; mounting union couplings on the respective ends of the pipeline; mounting annular sealing means on each end of the pipeline inwardly of the associated union coupling; tilting the axis of the device connections to a substantial extent relatively to the pipeline axis, passing one of the inlet or outlet connections of the device on to an end of the pipeline to an extent as to enable the device connections to be brought into a position coaxial with the pipeline; moving the device into said coaxial position; moving the device coaxially with respect to the pipeline to a position in which both inlet and outlet connections of the device extend over the respective ends of the pipeline; and tightening the annular couplings on to the inlet and outlet connections respectively of the device, thereby to clamp the sealing means between each coupling and the device so as to afford a seal between each connection of the device and the associated pipeline end.

3,927,452

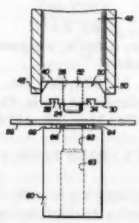
APPARATUS FOR ASSEMBLING SELF-FASTENING NUT TO A PANEL

Thomas M. Pouch, Farmington, and Harold A. Ladouceur, Livonia, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 454,656, March 25, 1974, Pat. No. 3,926,236, which is a division of Ser. No. 302,312, Jan. 30, 1972, Pat. No. 3,829,957. This application Jan. 6, 1975, Ser. No. 538,832

Int. Cl.² B23P *19/00*, *11/00*

U.S. Cl. 29—200 B **2 Claims**



1. An apparatus adapted to secure a nut to a panel, said nut having a planar end face, a central bore and a pair of grooves in said end face on either side of said bore, comprising: a punch member having a cylindrical punch portion and a nut

retainer means surrounding said punch portion adapted to releasably retain a nut telescopically assembled on said punch portion having an external diameter substantially equal to the internal diameter of said nut bore and having an axial extent greater than the axial extent of said nut bore to extend beyond said planar end face of the nut with the nut assembled on said punch portion, and a die member having a generally planar end face, said die end face having an opening in registry with said punch portion to receive the punch portion and a pair of upstanding lips, on either side of said opening in registry with said nut grooves, whereby a panel, interposed between said nut and said die will, upon relative movement of said punch and die members, be sequencially punched to form a hole in registry with said nut bore and deformed into said nut grooves by said upstanding lips, in one continuous movement.

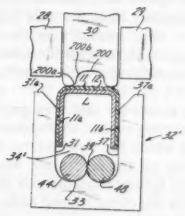
3,927,453
APPARATUS FOR FORMING INSULATED SPLICES

Irwin Zahn, New York, and Feroz Husain, Rego Park, both of N.Y., assignors to General Staple Company, New York, N.Y.

Continuation-in-part of Ser. No. 335,417, Feb. 23, 1973, abandoned. This application Jan. 17, 1974, Ser. No. 434,185

Int. Cl.[2] H01R *43/04*

U.S. Cl. 29—203 D **11 Claims**



1. Apparatus for connecting two elements for forming terminals comprising:

means for feeding a composite supply strip formed from an elongated layer of non-conductive material and an elongated layer of electrically conductive material;

means for servering a predetermined length of said supply strip from the remaining supply of said strip and

crimping means for crimping said length about elements to be joined until said electrically conductive material is in contact with said elements, said crimping means including a die, wherein said die comprises:

a body portion having a generally U-shaped receptacle defined by a bottom wall, and a pair of side walls, and

an elongated ridge in said bottom wall, said ridge and bottom wall defining a pair of concavely arcuate circular segments, each of said circular segments extending from said ridge to said side walls, the imaginary circles of which said segments form a portion being disposed tangentially with respect to one another so as not to overlap one another.

3,927,454
APPARATUS FOR PRODUCING LAMINATED MAGNETIC CORES FOR INDUCTIVE ELECTRIC APPARATUS

Kazuhiro Kobayashi; Hiroshi Saito, both of Hitachi; Yukio Ogawa, Katsuta; Koki Yoshida, and Isamu Kondo, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 350,970, April 13, 1973, Pat. No. 3,875,660. This application Sept. 11, 1974, Ser. No. 505,011

Int. Cl.[2] H01F *41/02*

U.S. Cl. 29—203 L **13 Claims**

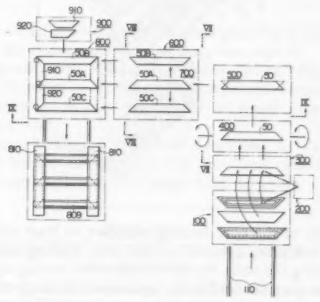
1. An apparatus for producing a laminated magnetic core for use in an inductive electric apparatus, comprising:

a bogie on which a plurality of silicon steel plates for composing the core leg portions are placed in a stack conversely to the order of lamination in the finished core, said bogie being movable in one direction;

a sucking and transferring means provided at the end of the one-way movement of said bogie for sucking said stacked silicon steel plates one by one from the topmost plate of the stack, carrying the sucked-up one of said plates to the first conveyor adjacent said bogie, and, upon reaching said conveyor, releasing said plate onto said conveyor;

a reversing means provided at the end of said first conveyor and arranged turnable about 180° in the direction of transfer of the plate in response to a reversal instruction while keeping housed therein the silicon steel plate transferred thereinto from said first conveyor;

a second conveyor provided adjacent said reversing means and adapted to receive and carry each silicon steel plate transferred thereonto from said reversing means;



means for separating the silicon steel plates transferred from said second conveyor, whereby said plates are separated in substantially parallel relation and at fixed intervals successively and in a given order such that the longitudinal direction of said plates will correspond to the direction of the position where the core leg portions are composed;

a third conveyor for further transferring said separated silicon steel plates in one direction and in a given order; and

a core stacking mechanism whereby the respective silicon steel plates transferred from said third conveyor are detained and laminated successively at each leg portion composing position according to a selected core lamination pattern, said core stacking mechanism being lowered correspondingly to the number of layers of the core to be formed.

3,927,455
APPARATUS FOR MAKING FERRITE MATRICES

Jury Emelyanovich Seleznev, Vesenny proezd,4a,kv.16; Jury Alexandrovich Burkin, Tsvetnoi proezd,29,kv.24, and Sergei Vladimirovich Kuzmin, ulitsa Akademicheskaya,19,kv.54, all of Novosibirsk, U.S.S.R.

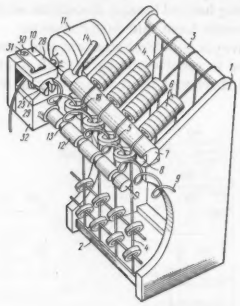
Division of Ser. No. 319,053, Dec. 27, 1972, Pat. No. 3,858,310. This application Oct. 18, 1974, Ser. No. 516,039

Int. Cl.[2] H01F *41/08*

U.S. Cl. 29—203 MM **9 Claims**

1. An apparatus for making ferrite matrices from ferrite cores that have been arranged in at least one stack received about at least one wire, the number of the ferrite cores in a stack being equal to the number of the lines in a matrix to be made, the apparatus comprising: a framework adapted to support wires with stacks of ferrite cores received thereabout; a core feeding member having at least one longitudinal guide means adapted to separate single ones of the cores and to

support therein a row of the ferrite cores, the core feeding member having the wires with the stacks of the cores passing thereover at one side thereof, the core feeding member spacing the wires at uniform intervals; at least one mechanism for winding an additional wire into a helix, mounted adjacent to a face end of the core feeding member, the mechanism, in order to thread the additional wire, winding the same into the helix having a pitch equal to the spacing between the centers of the ferrite cores supported in the row in the guide means of the core feeding member; a drive of the mechanism for winding the additional wire into the helix, adapted to effect rotation of the helix, with simultaneous forwarding of same longi-



tudinally of the core feeding member; at least one auxiliary roller extending parallel to the core feeding member and contacting the helix, the additional roller having a plurality of annular grooves uniformly spaced therealong, the spacing being equal to the pitch of the helix; the auxiliary roller being mounted so that the annular grooves thereof are staggered with respect to the centers of the ferrite cores, supported in the guide means of the core feeding member, by a distance corresponding to the helix angle of the helix; the auxiliary roller being associated with the drive and is being rotated thereby in a direction opposite to the direction of the winding of the helix.

3,927,456

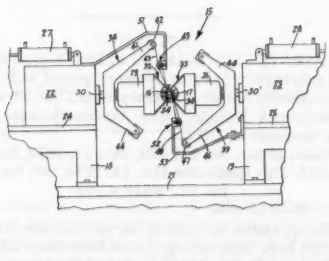
COIL WINDING MACHINE WITH IMPROVED WIRE GRIPPING AND CUTTING MEANS

Raymon H. Dammar, Minneapolis, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 721,805, April 16, 1968, abandoned. This application Apr. 2, 1971, Ser. No. 130,649

Int. Cl.[2] H02K *15/09*

U.S. Cl. 29—205 C **34 Claims**



1. In an armature winding machine for winding a continuous length of wire into a series of connected coils onto the slotted cores of armature core assemblies, each of which includes in addition to the slotted core a commutator with tangs on its circumferentially spaced bars with the wire forming the ending lead of one coil continuing uninterruptedly to form the starting lead of another coil and with said uninterrupted leads as well as the starting lead and ending lead of the entire series of coils attached to tangs of the commutator, the combination of:

A. core gripping means to hold an armature core assembly in winding receiving position;

B. a rotatable flyer to draw wire from a source thereof and wind it into a series of connected coils onto the slotted core of an armature core assembly in the grasp of said core gripping means with the leads connecting successive coils unbroken and attached to the commutator tangs;

C. mounting means for said rotatable flyer by which the same is constrained to rotation about an axis transversely intersecting an armature core assembly in the grasp of said core gripping means;

D. means to sever the stretch of wire leading from the flyer to an armature core assembly in the grasp of said core gripping means, said last named means comprising

1. wire gripping means operable to grip said stretch of wire,

2. wire cutting means operable to sever said stretch of wire, said wire cutting means comprising

a. a knife element having a cutting edge, and

b. mounting means for said knife element so disposed with respect to the wire gripping means that the cutting edge of the knife element is transverse to the wire extending from the wire gripping means to the armature core assembly in the grasp of said core gripping means, to sever the same at a point between the wire gripping means and the armature core assembly;

3. mounting means for said wire gripping means and for said wire cutting means, so disposed with respect to the axis about which the flyer rotates that at the time the wire cutting means severs the wire, the wire cutting means is no farther from the axis about which the flyer rotates than the circular orbit defined by the flyer; and

4. means for actuating the wire gripping means and the wire cutting means to effect severance of the wire while the wire gripping means has the wire in its grip; and

E. means for so timing the operation of the wire gripping means and the wire cutting means with respect to one another and the operation of the flyer that the wire gripping means grips said stretch of wire only upon cessation of wire winding rotation of the flyer at the completion of the armature being wound, and retains its grip thereon after the cutting means has severed the same and until the wound armature has been removed and replaced by an unwound armature core assembly and the winding thereof by the rotating flyer is begun.

3,927,457

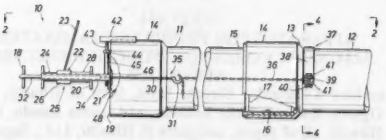
PIPE-SEATING APPARATUS

Alton H. Bickle, 2135 Shadowdale, No. 141, Houston, Tex. 77043

Filed Nov. 6, 1974, Ser. No. 521,455

Int. Cl.[3] B23P *19/04*

U.S. Cl. 29—237 **52 Claims**



1. A pipe-seating apparatus for seating the spigot end of a first pipe section into the hub or receiving end of a second pipe section against a flexible seal, comprising

pipe-engaging means for securely engaging the second pipe section,

driving means having a first member for engaging the other open end of the first pipe section and a second member spaced and axially displaceable therefrom in a direction generally axially of said pipe sections,

force-exerting means disposed between and interconnecting said first and second members of said driving means for exerting a generally axial force for laterally displacing said first and second members,

connecting means for interconnecting said pipe-engaging means and said second member of said driving means, said connecting means being substantially non-extensible under tension for preventing displacement of said second member, said displacing force exerted by said force-exerting means between said first and second members laterally displacing said first member and axially driving the first pipe section spigot end into the hub or receiving end of the second pipe section, and

guide means cooperating with said first and second beam members and said connecting means for preventing rotational movement of said first beam member with respect to said second beam member during displacement.

3,927,458

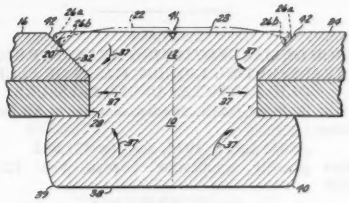
CROWNED HEAD RIVET METHOD

Eugene R. Speakman, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Continuation-in-part of Ser. No. 291,669, Sept. 25, 1972. This application June 3, 1974, Ser. No. 475,793

Int. Cl.² B23Q *17/00;* **B21D** *39/00;* **B23P** *11/00*

U.S. Cl. 29—407 **8 Claims**



1. A method for joining a plurality of structural members comprising the steps of:

forming a uniformly flared countersunk opening having maximum and minimum diameters in one of said structural members;

forming axially aligned cylindrical openings of a predetermined diameter similar to the minimum diameter of said countersunk opening and in registration therewith in said structural members;

inserting a rivet through said registered openings, said rivet having a shank and a head of shapes complementary to said openings and a shank end, said rivet head having an upper surface shaped generally similar to the minor portion of a filled torus to form a crown having a generally planar central portion, the planar central portion extending above the plane of the maximum diameter periphery of said countersunk opening by a distance of at least .002 inch, said generally planar central portion and said shank end having similar areas; and

deforming said rivet in response to compressive force applied to said generally planar central portion and said shank end to the extent that material in said rivet flows axially inwardly and radially outwardly to apply outward force along said cylindrical openings, thereby altering said rivet head shape and said shank end shape so that said generally planar central portion is no further than .003 inch above the plane of the maximum diameter periphery of said countersunk opening.

3,927,459

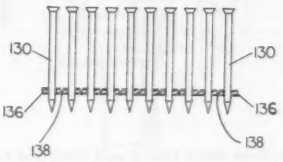
PROCESS FOR FEEDING AND DRIVING NAILS

Harry M. Haytayan, Sunnyside Lane, Lincoln, Mass. 01773

Division of Ser. No. 312,665, Dec. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 68,423, Aug. 31, 1970, Pat. No. 3,711,008. This application Aug. 12, 1974, Ser. No. 496,458

Int. Cl.² B23P *17/00*

U.S. Cl. 29—413 **5 Claims**



1. In a process for feeding and driving a plurality of flanged-head nails, the improvement comprising the steps of:

1. feeding said nails serially to a nailing device while supported in series by a strip of preformed nail flanges that are connected to one another only at points of mutual tangency; and

2. successively driving each nail lengthwise so that its flanged-head is driven flush with the flange which supports it and separates that flange from said strip.

3,927,460

PRETREATING PROCESS FOR VITREOUS ENAMELLING

Shunichi Harada, and Hideo Abe, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 7, 1972, Ser. No. 278,194

Int. Cl.² B23P *17/00;* **B22D** *11/126*

U.S. Cl. 29—424 **10 Claims**

1. A vitreous enamelling process for a steel sheet, comprising roughening the steel sheet by electrolysis, applying an aqueous solution of water glass on the roughened surface and drying the solution to form a water glass layer thereon, press shaping the steel sheet having the water glass layer thereon, washing away the water glass layer with water and applying a vitreous enamel layer on the roughened surface of the steel sheet after the water glass layer is washed away.

3,927,461

METHOD OF MAKING RANDOMLY DIFFERENT DISPLAY DEVICES

Adam Peiperl, 1135 Loxford Terrace, Silver Spring, Md. 20901

Filed Oct. 5, 1973, Ser. No. 404,009

Int. Cl.² B29C *25/00*

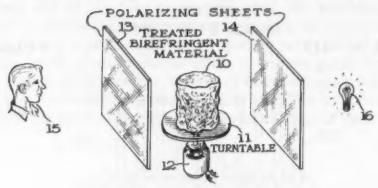
U.S. Cl. 29—424 **4 Claims**

1. A method of preparing birefringent material which is subject to fusing and warping from the heat of a flame, for use in display devices for viewing in polarized light, comprising the steps of

forming the birefringent material to a desired shape,

spraying said birefringent material with non-flammable, non-volatile liquid droplets distributed to provide a random effect,

applying a flame to various areas having droplets thereon wherein the areas under the droplets are protected



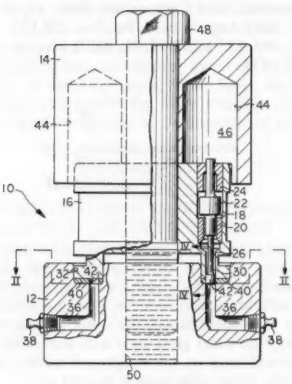
thereby from direct heat of said flame and causing areas around the droplets to fuse partially and warp.

3,927,462

METHOD AND APPARATUS FOR REMOVING PLUNGERS FROM PISTON ASSEMBLIES

William H. Freeman, and Herschel M. Williamson, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 3, 1975, Ser. No. 555,003
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **10 Claims**



1. A method for removing plungers and press fit inserts from a piston assembly, said method comprising:

positioning a piston assembly on a complementally formed base member;

aligning the piston assembly so that the plunger bores are axially aligned with corresponding supply bores in the base member;

securing the piston assembly on the base member; and

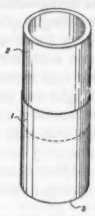
injecting a hydraulic medium through the base member bore and into the piston assembly plunger bore wherein the hydraulic pressure generated by the hydraulic medium on the plunger and insert will urge the plunger and insert out of the piston assembly.

3,927,463

METHOD OF MAKING A CYLINDRICALLY SHAPED, HOLLOW ELECTROFORMING MANDREL

Donald G. Dupree, Aita Loma, Calif.; Raymond E. Bailey, and Chester H. K. Ling, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 265,918, June 23, 1972, which is a continuation-in-part of Ser. No. 89,215, Nov. 13, 1970, abandoned. This application July 12, 1974, Ser. No. 488,138
Int. Cl.² B23P *11/02*
U.S. Cl. 29—447 **7 Claims**



1. A method of making a cylindrically shaped, hollow, permanent mandrel suitable for surficial electrodeposition of a xerographic belt substrate of nickel comprising;

a. providing a cylindrical, hollow metal core member,

b. providing a metal sleeve having a thickness of between about **10** and **60** mils and consisting essentially of nickel,

c. mounting said sleeve on said core member,

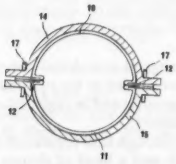
d. coating the outer surface of said sleeve with chromium.

3,927,464

METHOD OF MANUFACTURING MEANS FOR STORING AND TRANSPORTING LIQUIDS, GASES OR FLUIDIZED SOLID PARTICLES UNDER PRESSURE

Hans Ivar Wallsten, Saffle, Sweden, assignor to AB Inventing, Sweden

Filed Jan. 9, 1974, Ser. No. 431,882
Claims priority, application Sweden, Feb. 12, 1973, 7301929
Int. Cl.² B23P *19/04*
U.S. Cl. 29—454 **8 Claims**



1. A method for manufacturing tubular means for storing and transporting liquids, gases and fluidized solid particles under pressure, comprising the steps of:

a. arranging a pair of thin, flexible, stretchable, liquid tight inner wall sheet portions in abutting surface relationship;

b. joining the pair of inner wall sheet portions to each other along at least one free edge contour to form a continuous inner wall channel network, the inner wall channels in the unexpanded state having a normally flat cross-section and expandable under internal pressure to have a circular cross-section;

c. arranging each of a pair of flexible outer wall sheet portions upon each of a pair of opposed outwardly directed surfaces of the normally flat inner wall, the outer wall sheet having a strength relatively greater than the inner

wall sheet and sufficient to withstand the expansion pressure within the inner wall channel network; and

d. joining the pair of outer wall sheet portions to each other along at least one edge contour outwardly positioned beyond the periphery of the inner wall channel network to form a continuous, normally flat outer wall network unattachedly enclosing the inner wall channel network, the outer wall assuming a substantially circular cross-section responsive to the expansion of the enclosed inner wall, thereby limiting the expansion of the inner wall channel network.

8. A method as set forth in claim **6**, wherein steps (d) and (e) further include the step of continuously heat-sealing the opposed edge contours of the inner wall pair of sheets along their entire length simultaneous with the step of joining the pair of outer wall material sheets.

3,927,465

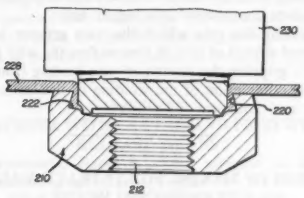
METHOD OF FORMING A NUT AND PANEL ASSEMBLY

Harold A. Ladouceur, Livonia, and John H. Steward, Bloomfield Hills, both of Mich., assignors to Multifastener Corporation, Detroit, Mich.

Division of Ser. No. 397,559, Sept. 14, 1973, Pat. No. 3,878,599, which is a continuation-in-part of Ser. No. 63,316, Aug. 12, 1970, abandoned, which is a division of Ser. No. 841,037, July 11, 1969, abandoned. This application Oct. 21, 1974, Ser. No. 516,317

Int. Cl.[2] **B21D** *39/00*; **B23P** *11/00*

U.S. Cl. 29—509 **4 Claims**



1. A method of forming a nut and panel assembly, said nut having a panel supporting surface and a central bore generally perpendicular to said nut surface, said surface having an annular groove defined therein surrounding said bore, said groove having an outer wall inclined inwardly from the bottom wall of said groove and said groove bottom wall spaced farther from the plane of said surface adjacent said bore then at said inclined outer wall to define an annular tool receiving recess adjacent said bore, including the steps of:

a. disposing said nut surface aginst one face of the panel,

b. advancing a punch against the opposed side of said panel, said punch having an annular end portion conforming to said nut groove tool receiving recess and said panel having an aperture generally aligned with said nut bore,

c. further advancing said punch, into said nut groove, to deform the edge of said panel aperture into said nut groove, over said inclined outer groove wall, and

d. continuing to advance said punch into said nut groove, beyond said panel edge and into said tool receiving recess, to (1) deform said panel edge against said bottom groove wall, adjacent said outer wall, and (2) deform and compress said panel edge beneath said inclined outer groove wall to securely retain said nut on said panel.

3,927,466

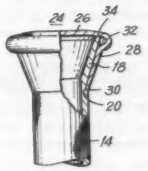
METHOD OF MAKING METAL BALL-BAT

Ivan Rosalsky, Montclair, N.J., assignor to Airlite Aluminum Corporation, Kearny, N.J.

Filed Feb. 28, 1974, Ser. No. 446,933

Int. Cl.[2] **B21D** *39/00*; **B23P** *11/00*

U.S. Cl. 29—511 **4 Claims**



1. The method of making a metal ball-bat which comprises deforming the metal at one end of a hollow cylinder to close off said end, reducing the diameter of the cylinder at the other and open end of said cylinder to extend the length thereof thereby to form a handle portion of uniform diameter, forming an annular peripheral recess in the handle spaced from the open end of the cylinder, applying an inverted side-walled cap of metal over the said other end and crimping the side walls of the cap against the open end of the cylinder and forcing the ends of the side walls into the recess to lock the cap against rotary and longitudinal movement with respect to the bat.

3,927,467

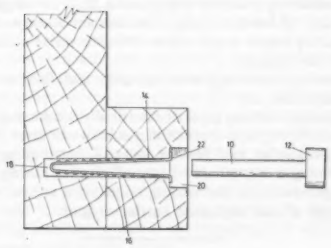
LOCATING AND SECURING OF WOOD JOINTS

Musgrave Schoeman, P.O. Westville, Natal, South Africa

Filed July 16, 1974, Ser. No. 489,793

Int. Cl.[2] **F16B** *13/06*

U.S. Cl. 29—526 **2 Claims**

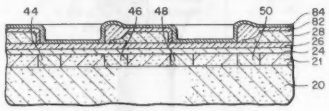


1. A method of joining pieces of wood or the like including the steps of forming registering holes in the pieces, at least one of the holes being countersunk, locating therein a strip of material extending through both holes, the strip having a width less than the diameter of the holes with formations for gripping both pieces of wood and having a turned over locating portion adapted to rest on the bottom of the countersink, and then inserting a headed dowel of substantially the same diameter as the holes, into the two holes, and against the strip, the dowel having a head complementing the countersink and received therein.

3,927,468
SELF ALIGNED CCD ELEMENT FABRICATION METHOD THEREFOR

Michael P. Anthony, San Carlos; Kamleshwar Gunsagar, Cupertino; Choong-Ki Kim, Sunnyvale, and Lloyd R. Walsh, San Jose, all of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 28, 1973, Ser. No. 429,329
Int. Cl.² B01J *17/00*
U.S. Cl. 29—578 **5 Claims**



1. A process for fabricating a self-aligned charge-coupled semiconductor structure comprising the steps of:

a. forming at least one insulating layer on one surface of a semiconductor substrate;

b. forming a layer of electrically conducting material on said at least one insulating layer;

c. forming an overlying insulating layer on said layer of electrically conducting material;

d. removing portions of said overlying insulating layer at regular intervals to demarcate the location of barrier regions to be formed in underlying registration in said substrate;

e. forming implanted barrier regions in the top-most portion of said semiconductor substrate at regular intervals along said substrate;

f. forming filled-in insulating regions within said removed portions, wherein said filled-in insulating regions are of a material different from said overlying insulating layer;

g. removing alternating remaining portions of said overlying insulating layer and those said filled-in insulating regions above a first series of alternate barrier regions to expose portions of said conducting material;

h. removing the exposed portions of said conducting material using those still remaining portions of said overlying insulating layer and said filled-in insulating regions as a mask wherein the remaining portions of said layer of conducting material constitute a first set of gate electrodes which have edges in substantial alignment with leading edges of the other alternate series of implanted barrier regions;

i. forming insulating material over said first set of gate electrodes; and

j. applying a further layer of electrically conducting material over the exposed areas of said at least one layer of insulating material, said further layer of conducting material forming a second set of gate electrodes having edges in alignment with the leading edges of a second alternate series of said implanted barrier regions.

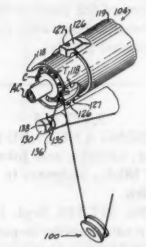
3,927,469
METHOD OF WINDING ARMATURES

Raymon H. Dammar, Minneapolis, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Division of Ser. No. 130,649, April 2, 1971, which is a continuation-in-part of Ser. No. 721,805, April 16, 1968, abandoned. This application Mar. 22, 1973, Ser. No. 342,551
Int. Cl.² H02K *15/09*
U.S. Cl. 29—597 **25 Claims**

1. In the winding of armatures by means of an automatic winding machine wherein an armature core assembly having a slotted core to receive the coils comprising the armature winding and a commutator with lead receiving tangs is held in winding receiving position while a rotating flyer winds wire drawn from a source thereof into a series of coils onto the slotted core and the ends of the individual coils as well as the beginning and end of the series of coils are attached to the tangs, the method of handling the wire at the termination of the winding of the last coil in the series and at the start of the winding of an unwound armature core assembly that has replaced the wound and removed armature, said method comprising the steps of:

A. at the conclusion of the winding of the last coil in the series and while the just wound armature is still in winding receiving position, by means of a wire gripper gripping the stretch of wire that extends from the flyer to the armature;



B. while said stretch of wire is thus gripped, severing the same at a point between its gripped portion and the armature to thereby free the just wound armature for removal from the machine;

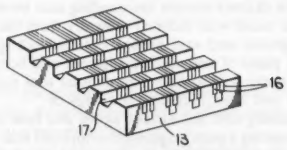
C. retaining the grip on the stretch of wire while the wound armature is removed from the machine and replaced with an unwound armature core assembly and at least until the winding of the first coil in the series to be wound onto said armature core assembly is begun; and

D. releasing the grip which the wire gripper has on the severed stretch of wire in time to free the wire gripper for use in gripping the stretch of wire leading from the flyer at the completion of the winding of the last coil wound onto said armature coil assembly.

3,927,470
METHOD OF MAKING MULTI TRACK MAGNETIC TRANSDUCING HEADS

Derek Frank Case, 122 Cadbury Road, Sunbury on Thames, England

Filed Dec. 7, 1973, Ser. No. 422,685
Claims priority, application United Kingdom, Dec. 29, 1972, 60151/72
Int. Cl. H01f *7/06*
U.S. Cl. 29—603 **7 Claims**



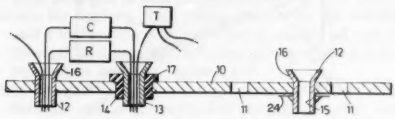
1. A method of manufacturing a plurality of magnetic heads including the steps of; providing a support of non-magnetic material; forming a plurality of spaced parallel grooves in the support; bonding ferrite strip elements in said groves thereby to provide an assembly including a plurality of strips of non-magnetic material alternating with strips of ferrite in spaced parallel relationship; machining a plurality of spaced groves in the support parallel to the length of the elements so as to remove material from at least one side wall of each ferrite element; and subsequently dividing the assembly transversely

of the length of the strip elements into a plurality of shaped ferrite pieces in said spaced relationship.

3,927,471
ELECTRONIC CIRCUITS

Keith Arthur Tricker, High St., Cavendish, Sudbury, Suffolk, England

Filed Jan. 28, 1974, Ser. No. 437,305
Claims priority, application United Kingdom, Feb. 2, 1973, 5289/73
Int. Cl.² H05K *3/32*
U.S. Cl. 29—625 **8 Claims**



1. The method of fabricating an electrical circuit without the use of solder to a rigid conductive panel having a multiplicity of apertures extending therethrough, which method comprises the steps of:

inserting a plurality of sleeves of insulating material into the apertures of the panel in a predetermined array;

inserting from one side of the panel a like plurality of conductive collars in the said array through the sleeves of insulating material to provide a portion of each collar projecting upon the other side of the panel.

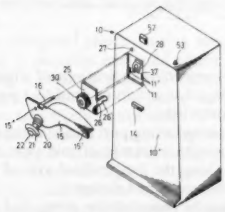
inserting wires in the required pattern through the collars from the said one side of the panel to make up the required electrical circuit;

uniting each collar with the wires passing therethrough by means of an inwardly crimping operation effected on said projecting portion of each collar thereby clamping the wires inserted into each collar into electrical connection with each other and mechanically retaining the wires and collars in position in the panel.

3,927,472
CAN OPENER WITH CUTTER AND FEED WHEEL RELEASE MEANS

Osamu Yamamoto, Nagoya, Japan, assignor to Kabushiki Kaisha Aichidenkikosakusho, Japan

Filed Jan. 30, 1975, Ser. No. 545,469
Claims priority, application Japan, Mar. 12, 1974, 49-28242; May 10, 1974, 49-52675
Int. Cl.² B67B *7/38*
U.S. Cl. 30—4 R **10 Claims**



1. In an electrically powered can opener having a housing, a driving shaft rotatably supported in said housing and an electric motor for rotating said driving shaft, a combination therewith of a front member of said housing, a cutter base having a grip at one end portion, a circular cutter rotatably carried by said cutter base, a pivotal shaft attached to said cutter base at its one end, said pivotal shaft being inserted rotatably through said front member so as to position said cutter base right before said front member, a base closely mounted on said front member and provided with an aperture, a feed wheel holder inserted loosely in said aperture, a feed wheel carried rotatably by said feed wheel holder, latching members secured vertically on said base, said latching members extending in the interior of said housing through slots bored through said front member, said feed wheel holder and said driving shaft being connected so that rotation may be transmitted from the latter to the former and both may be separable axially from each other, a locking member operable from the exterior of said housing and movable vertically, said locking member having such a form that at a certain position thereof it cooperates with said pivotal shaft and said latching members to preclude the separation of said cutter base and said base from said front member, a spring for biasing said locking member to a position where said locking member engages with said pivotal shaft and said latching members, the engagement between said locking member and said pivotal shaft being released by depressing said locking member against said spring by a certain distance and the engagement between said locking member and said latching member being released by depressing said locking member against said spring by a larger distance.

6. In an electrically powered can opener having a housing, a driving shaft rotatably supported in said housing and an electric motor for rotating said driving shaft, a combination therewith of a front member, a cutter base having a grip at one end portion, a circular cutter rotatably carried by said cutter base, a pivotal shaft attached to said cutter base at its one end, said pivotal shaft being inserted rotatably through said front member so as to position said cutter base right before said front member, a base closely mounted on said front member and provided with an aperture, a feed wheel holder inserted loosely in said aperture, a feed wheel carried rotatably by said feed wheel holder, latching members secured vertically on said base, said latching members extending in the interior of said housing through slots bored through said front member, said feed wheel holder and said driving shaft being connected so that rotation may be transmitted from the latter to the former and both may be separable axially from each other, a locking member operable from the exterior of said housing and movable vertically, said locking member having such a form that at a certain position thereof it cooperates with said pivotal shaft to preclude the separation of said cutter base from said front member, a spring for biasing said locking member to a position where said locking member engages with said pivotal shaft, the engagement between said locking member and said pivotal shaft being released by depressing said locking member against said spring, a base locking member movable vertically and adapted to be operated by said locking member not engaging with said pivotal shaft, said base locking member having such a form that at a certain position thereof it cooperates with said latching members to preclude the separation of said base from said front member, and a second spring for biasing said base locking member to a position where said base locking member engages with said latching member, the engagement between said base locking member and said latching members being released by depressing said locking member, which is not engaging with said pivotal shaft, against said second spring.

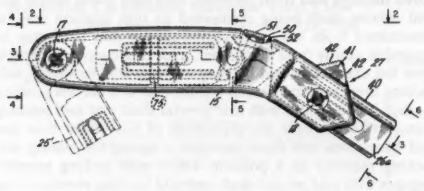
3,927,473
REPLACEABLE BLADE KNIFE

Paul A. Braginetz, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 461,887
Int. Cl.² B26B *5/00*
U.S. Cl. 30—125 **8 Claims**

1. A knife having an elongated handle with opposed side walls and a cavity therebetween and a blade removably mounted at one end of the handle for replacement by a new blade, a tray for new blades normally positioned within said cavity and mounted for movement into a closed position

within said cavity and outwardly thereof through an opening in an edge of the handle for removal of a blade, said tray having a supporting platform for a stack of blades, a rib extending upwardly from said surface transversely of the direction of said movement adapted to receive thereover the slots

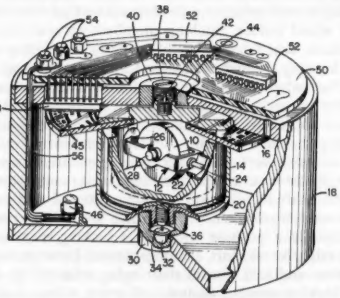


of a stack of slotted blades, said rib having end lug portions extending above the stack of blades with a depression between the lugs, and the corresponding handle wall having a downwardly projecting fixed rib extending into said depression in closed position of the tray transversely of said tray rib to maintain the top blade below the top of said lug portions.

3,927,474
INTERNALLY GIMBALLED COMPASS

James M. Lapeyre, New Orleans, La., and John T. Fowler, Winthrop, Mass., assignors to The Laitram Corporation, New Orleans, La.

Filed Aug. 7, 1973, Ser. No. 386,303
Int. Cl. G01c *17/18*; **G06m** *1/272*
U.S. Cl. 33—356 **7 Claims**



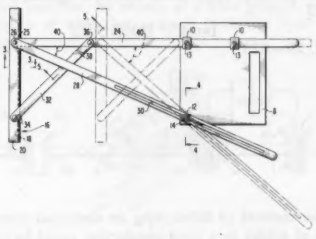
1. A magnetic compass comprising:
a first housing;
a compass card having indicia on a surface thereof representative of compass heading;
a second housing affixed to said compass card and rotatably mounted in said first housing for rotation about the axis of said compass card;
at least one magnet coupled to said compass card and having a magnetic axis orthogonal to one rotational axis thereof; and
a gimbal assembly supported within said second housing and operative to suport said at least one magnet for independent rotation throughout 360° about orthogonal axes transverse to the axis of said compass card.

3,927,475
SAW GUIDE

Kenneth Chang, 47-425-A Mahakea Road, Kaneohe, Hawaii 96744

Filed Jan. 2, 1975, Ser. No. 538,022
Int. Cl.² B43I *13/02*
U.S. Cl. 33—42 **5 Claims**

1. A guide for a saw, wherein the saw has a base plate,
means on one end of the base plate forming a guideway running traversely to the fore-and-aft direction of the base plate, and a clamp member spaced from the guideway towards the other end thereof, said guide comprising,
an elongate gauge member adapted to engage and slide along a straight edge associated with work to be sawed,
a first arm having an inner end joined to the gauge member and an outer end portion engageable at a selected location along the length thereof in the guideway on the saw base plate,

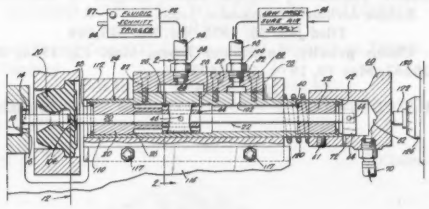


means for maintaining the first arm at right angles to the length of the gauge member, and a second arm,
pivot means connected an inner end of the second arm to the gauge member at the juncture of the inner end of the first arm with said gauge member,
the second arm having an outer end portion engageable at a selected point therealong by the clamp means on the saw base plate, whereby said arms and said base plate form a rigid right triangle when the other end portion of said second arm is clamped to said base plate.

3,927,476
APPARATUS FOR CHECKING A DIMENSION OF AN OBJECT

Frederick W. Martin, Pottstown, Pa., assignor to The West Company, Phoenixville, Pa.

Filed May 31, 1974, Ser. No. 475,113
Int. Cl.² G01B *7/02*, *7/06*
U.S. Cl. 33—143 L **12 Claims**



1. Apparatus for providing indications of whether a linear dimension of an object is within or outside a predetermined range of values, comprising:
hollow tubular means having port means in the wall thereof, the axially opposite extremes of said port means being spaced apart along the longitudinal axis of said tubular means by a predetermined distance;
piston means axially reciprocable along said longitudinal axis in said tubular means and having land regions the axial extremes of which are spaced apart along said longitudinal axis by a distance substantially equal to said predetermined distance plus the extent of said range of dimension values, said piston means being axially positionable along said longitudinal axis so that said land regions block said port means only over a predetermined range of axial positions of said piston means substantially equal in extent to said predetermined range of dimension values;

positioning means for removably positioning an object whose linear dimension is to be measured so that one surface thereof corresponding to one terminus of said dimension is in a predetermined reference axial position with respect to the longitudinal dimension of said tubular means, and so that another surface corresponding to the other terminus of said dimension determines the axis position of said piston means along said longitudinal axis, said reference axial position being such that an object having a value of said dimension at the center of said range of dimension values causes said piston means to assume an axial position at the center of said range of axial positions of said piston means;

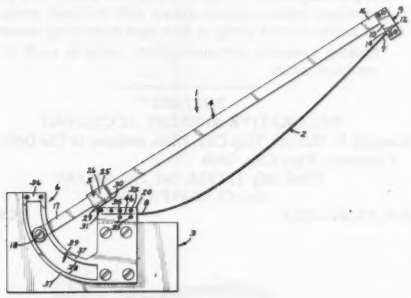
means for applying fluid under pressure to the interior of said tubular means so as to cause a flow of said fluid through said port means when said port means is not blocked by said land regions; and

fluid-flow detecting means responsive to the flow of fluid through said port means for producing a first output signal when the rate of said flow is below a small threshold level and for producing a second output signal discretely different from said first output signal whenever said rate of flow exceeds said threshold level.

3,927,477
CURVE-DRAWING APPARATUS

Timothy L. Harris, 1304 Bidwell, West St. Paul, Minn. 55118

Filed Mar. 27, 1975, Ser. No. 562,479
Int. Cl.² B43L *13/22*
U.S. Cl. 33—177 **6 Claims**



1. Apparatus for use in drawing exponential type curves on a coordinate system, comprising:

a. a base member selectively positionable on the coordinate system;

b. a thin, elongated elastic tracing member having a base end and a movable end, said elastic member generally assuming a planar exponential curve shape along which one side of a parabolic like curve can be drawn when said ends are selectively positioned;

c. attachment means for attaching the base end of said elastic member to said base member such that the base end of said curved elastic member remains generally tangent to a selected line in the coordinate system as the position of said movable end is varied;

d. a support arm for guiding said elastic member and having first and second ends, said second end pivotally connected to the movable end of said elastic member;

e. support arm connecting means for pivotally and slideably connecting said support arm to said base member;

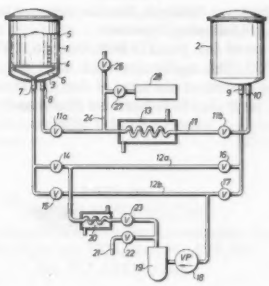
f. a guide track attached to said base member, said guide track having a pre-selected planar curved shape, in which the first end of said support arm is guided by said track to control the positioning of the first end of said support arm, said curve being generally coplanar with said flexible strip;

g. guide means for operably connecting said support arm first end to said guide track to control the positioning of said support arm; whereby movement of said first end of said support arm along said track will cause movement of said second end of said support arm along with sliding and pivoting meovement of said support arm with respect to said base by said support arm connecting means such that the movable end of said tracing member will be moved to cause said tracing member to assume a different curved shape.

3,927,478
METHOD AND APPARATUS FOR DRYING FIBROUS MATERIAL

Friedrich Wilhelm Johann Karrer, Stockholm, and Per Gustaf Mellgren, Vaxjo, both of Sweden, assignors to Karrer System AG, Zollikon, Switzerland

Filed Oct. 15, 1974, Ser. No. 514,774
Int. Cl.² F26B *3/00*
U.S. Cl. 34—20 **6 Claims**



1. An apparatus for drying fibrous material, comprising two closed containers each of which has a support for said fibrous material to be dried, said material being positioned on said support in a manner such as to divide the interior of each container into an inner and an outer chamber which communicate with each other solely via said material, a circulation system for serially interconnecting said containers by connecting said inner chambers to each other and said outer chambers to each other and containing a pump and a heat exchanger arranged in said circulation system in front of each container.

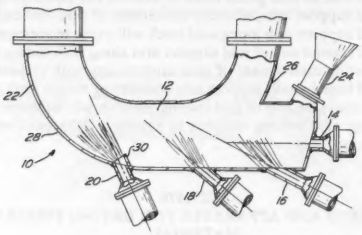
3,927,479
DRYING MILL FOR WET GRANULAR PARTICLES

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing & Equipment Co., Hatfield, Pa.

Filed Nov. 26, 1974, Ser. No. 527,251
Int. Cl.² F26B *17/00, 17/10*
U.S. Cl. 34—57 E **3 Claims**

1. In a dryer for drying wet particles wherein there is an inlet chamber, an upstack leading from one end of said inlet chamber, a downstack leading back into the inlet chamber, a classifier section connecting the upstack and downstack, an exhaust port between the classifier section and downstack, a particle feed inlet leading into the inlet chamber, a gas inlet nozzle at the upstream end of the inlet chamber opposite to said upstack, and a plurality of tangential gas inlet nozzles leading into the floor of said inlet chamber, the improvement which comprises a deflector within said inlet chamber in alignment with the last gas inlet nozzle downstream from said upstream end, said deflector and the portion of said floor surrounding said last gas inlet nozzle defining a nozzle orifice within said

inlet chamber which extends angularly from the plane of said floor at the downstream peripheral portion of said orifice to



an elevated position relative to said floor at the upstream peripheral portion of said orifice.

3,927,480

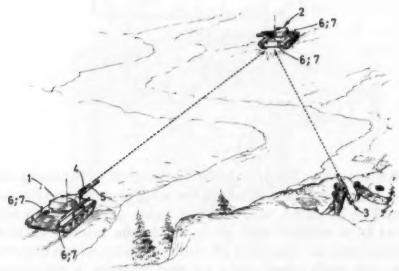
GUNNERY TRAINING SCORING SYSTEM WITH LASER PULSES

Hans R. Robertsson, Molndal, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Continuation of Ser. No. 318,008, Dec. 26, 1972, Pat. No. 3,832,791. This application Mar. 26, 1974, Ser. No. 454,941The portion of the term of this patent subsequent to Sept. 3, 1991, has been disclaimed.

Int. Cl.² F41G 3/26

U.S. Cl. 35—25 **3 Claims**



1. A method of evaluating the results of target practice with a weapon which has a barrel and which is located at a weapon position, firing at a target at a target position which is remote from the weapon position and which may be changing due to target motion, wherein firing from the weapon of a round of a selected type of ammunition is simulated by emitting radiation substantially coaxially with the weapon barrel from a directional radiation emitter such as a laser at the instant when the weapon is fired, and wherein a relationship between target location and the point of impact of said simulated round is calculated at the weapon position on the basis of detected radiation returned to the weapon position from reflector means at the target, said method being characterized by:

A. after a delay interval following said instant of simulated firing, which interval substantially corresponds to the time required for a real round of said ammunition to arrive at its point of impact, producing a further radiation emission from said radiation emitter that comprises a train of pulses in which is encoded information concerning selected ammunition type and relationship of said point of impact to target position, the directionality of the emitter ensuring that said information is delivered substantially only to a target at which the weapon is effectively aimed; and

B. at the target, combining said information with other information which relates to the vulnerability of the target, to produce an output signifying the hit effectiveness against that target of the simulated round as fired.

3,927,481

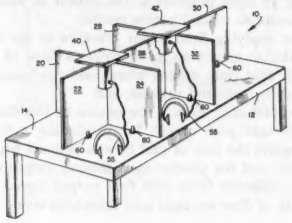
PORTABLE COLLAPSIBLE PARTITION FOR A TABLE

Nathan N. Safranek, 2 Morris Road, Bethpage, N.Y. 11714

Filed July 5, 1974, Ser. No. 485,824

Int. Cl.² A47G 5/00

U.S. Cl. 35—60 **4 Claims**



1. A portable, collapsible partition for forming carrels on a table top comprising:

a. a multiplicity of panels;

b. hinge means for securing said panels to each other to enable said panels to be manipulated in a plurality of different positions to create enclosed areas on said table top when said partition is unfolded;

c. separating means for positioning said panels in a predetermined relationship to create said enclosed areas; and

d. access means integral with said separating means for making available communication media in each of said enclosed areas.

3,927,482

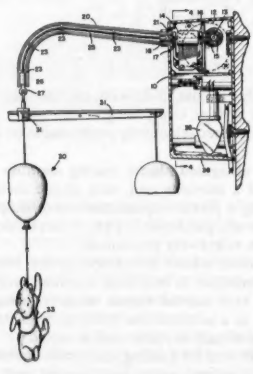
DECORATIVE NURSERY ACCESSORY

Kenneth N. Marcus, Tipp City, Ohio, assignor to The Dolly Toy Company, Tipp City, Ohio

Filed July 1, 1974, Ser. No. 484,686

Int. Cl.² G09F 11/00

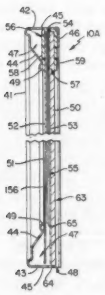
U.S. Cl. 40—28.1 **2 Claims**



1. A decorative nursery accessory comprising a housing adapted to be mounted on a wall, a motor on said housing, a music box in said housing driven by said motor via a drive shaft, a flexible shaft coupled to said drive shaft and driven by said motor, a guide for said shaft directing the free end thereof

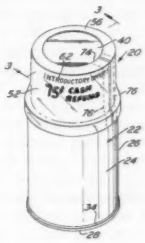
in a downward direction, a multiple unit mobile having a plurality of individual figures attached to the free end of said shaft and adapted to rotate adjacent the lower part of said housing in a horizontal plane, a translucent window in the lower part of said housing, and means on said housing for illuminating through said window less than all of said plurality of individual figures to cause said individual figures to be successively illuminated as said mobile is rotated.

3,927,483
FRAME CONSTRUCTION FOR A PLURAL PAGE DOCUMENT
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429
Division of Ser. No. 336,989, March 1, 1973, Pat. No. 3,807,071, which is a continuation-in-part of Ser. No. 271,925, July 14, 1972. This application Apr. 15, 1974, Ser. No. 460,745. The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.² G09F *1/12*
U.S. Cl. 40—102 **7 Claims**



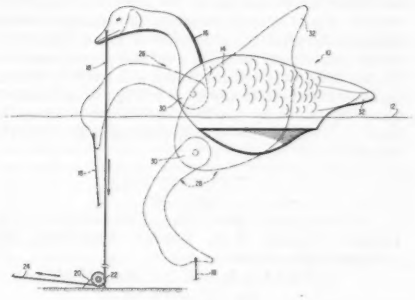
1. A picture-like frame construction exhibiting a plural page document comprising a plural page document, and a framing means disposed to define an open area therewithin as well as to define a channel means facing into said open area and in communication therewith, said frame construction having a plurality of flexible pocket members respectively receiving and holding said pages of said document in a serial manner and supporting the same in stacked hinged relation in said open area with the hinged part of at least said pocket members being hiddenly disposed in said channel means so that the outermost page appears to be the only page in the open area but permitting all of said pages to be manually fanned out through said open area thereof for individual viewing thereof, said open area defined by said framing means being substantially rectangular and thereby having two pairs of opposed sides, said pocket members for said pages of said document and said pages each having a substantially rectangular configuration and thereby having two pairs of opposed sides disposed adjacent said two pairs of opposed sides of said open area, only one side of one pair of opposed sides of at least said pocket members being disposed in said stacked hinged relation, the other pair of opposed sides of said pocket members disposed inboard of the respective pair of opposed sides of said open area of said framing means.

3,927,484
DIE-CUT COUPON SHRINK LABEL
William Spiegel, Southampton; Jacob Spiegel, Philadelphia both of Pa., and Albert Miller, Somerdale, N.J., assignors to Gilbreth Company, Cornwells Heights, Pa.
Filed Feb. 4, 1974, Ser. No. 439,463
Int. Cl.² G09F *3/00*
U.S. Cl. 40—307 **4 Claims**



1. A label for disposition on the cap of a container, said cap having a chime about the lower edge thereof, said label being a heat shrinkable tube and including advertising indicia thereon, said label including a peripheral edge having two opposed recessed portions cut therein and forming tapered extending portions which readily slide over said chime to facilitate the placement of the label on the cap prior to the shrinkage thereof.

3,927,485
WATER FOWL DECOY
John Thorsnes, Jr., 2416 N. Florida St., Arlington, Va. 22207
Filed Sept. 13, 1974, Ser. No. 505,897
Int. Cl.² A01M *31/06*
U.S. Cl. 43—3 **7 Claims**



2. A water fowl decoy, comprising:

a buoyant body member simulating the appearance of a natural water fowl's body when at rest on the surface of a body of water;

a neck and head portion pivoted to said body member for forward rotation about an essentially horizontal axis to a position in which at least a portion of said neck and head portion passes beneath said surface, said neck and head portion simulating the appearance of a natural water fowl's neck and head; and

a resilient member connected to said body member and said neck and head portion whereby said neck and head portion is normally restrained in a elevated position yet said neck and head portion alone may be rotated forward relative to said body member until the limit of the stretching capability of said resilient member is reached, and thereafter said body member and said neck and head

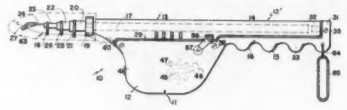
portion may be pivoted together forwardly into said body of water.

3,927,486

PORTABLE ANGLING ASSEMBLY

Kerry Yuen, 17 Crawson Bay, Winnipeg, Manitoba, Canada

Filed June 28, 1974, Ser. No. 484,125
Int. Cl.² A01K *87/00, 89/00*
U.S. Cl. 43—20 **7 Claims**



1. An angling assembly comprising in combination an enclosure including a reel carrying portion, a handle portion extending rearwardly from one end of said enclosure, a rod carrying portion on the upperside of said enclosure and a telescopic rod assembly in said rod carrying portion adapted to be moved from the fully extended position to an enclosed and stored position within said rod carrying portion and vice-versa, a spinning reel component mounted within said reel carrying portion, a winding handle mechanism operatively connected to said reel component and extending through the wall of said enclosure from one side thereof, and reel release means in said enclosure and also extending through the wall of said enclosure and being operatively connected to said reel component, said reel component including a reel release pin, said reel release means including a member pivoted by one end thereof in said enclosure and engaging the distal end of said reel release pin adjacent the other end of said member, and a lever mechanism extending through the wall of said enclosure, said lever mechanism comprising a finger operated lever portion exteriorly of said enclosure and a member engaging portion within said enclosure for moving said member and hence said release pin to the reel released position, said member of said reel release means comprising a substantially triangular member being pivoted to said enclosure by one corner thereof and including a release pin engaging side extending down from said one corner with a further side extending down from said one corner at an angle to said first side and being engageable by said lever mechanism whereby said release pin is moved substantially perpendicular to the plane of said reel.

3,927,487

FISHING ROD HOLDING LEVERAGE DEVICE

Toshiaki Miyamae, 2-16, 2-chome, Nishi-Iwata, Higashi-Osaka, Osaka, Japan

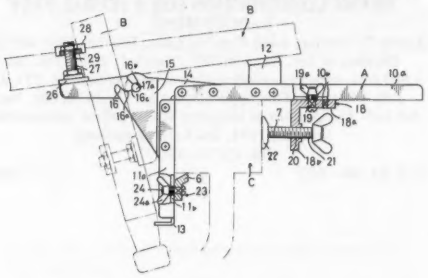
Filed July 2, 1974, Ser. No. 485,217
Int. Cl.² A01K *97/10*
U.S. Cl. 43—21.2 **1 Claim**

1. A fishing rod holding device comprising

A. anchoring means comprising a vertical plate and joined thereto at substantially right angles a horizontal plate, adjustable means disposed on both said vertical plate and said horizontal plate for anchoring said device, said anchoring means further comprising a fishing rod support means;

B. a pair of vertically disposed holding plates attached to said anchoring means at the juncture of said vertical and horizontal plates, said holding plates each having a hole of a first diameter aligned with each other and a larger diameter opening interconnected by a passageway having a width smaller than said diameter of said holes, the axis of said holes being located above the plane of said horizontal plate of said anchoring means;

C. receiving means comprising a pair of receiving elements shaped suitably to fit a fishing rod handle therebetween, a pair of adjustable bolt means, and means for engaging with said holding plates, said pair of adjustable bolt means connected to said means for engaging and holding fixedly said receiving elements with said fishing rod handle fit therebetween, said means for engaging comprising a structure means and a fulcrum shaft means having an axis alignable with said axis of said holes of said holding plates and having at each end thereof portions of a diameter substantially equal to the said diameter of said holes, and a portion thereof cut axially with the remaining diameter width substantially similar to the width of said passageway of said holding means, whereby said receiving means is



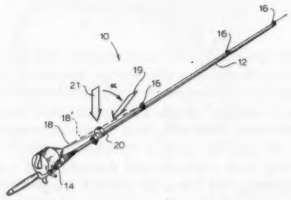
readily engageable with said holding plate by suitable vertical rotation and fitting of said cut portion of said shaft means through said opening and through said passageway and placement of said shaft means within said holes, thereby locking said shaft means within said hole for rotation to any radial position and thereby enabling removal by the reverse operation of rotating and passage of the cut portion through said passageway and whereby said fishing rod held by said receiving means is easily locked and rested on said fishing rod support means of said anchoring means in a rest position and readily rotated about said shaft means to another position.

3,927,488

DEVICE FOR PREVENTING TWISTS IN FISHING LINES

Aubrey R. Peddy, Rte. No. 1, Box 104, Groveland, Fla. 32736

Continuation-in-part of Ser. No. 503,646, Sept. 6, 1974, abandoned. This application Mar. 17, 1975, Ser. No. 558,930
Int. Cl.² A01K *87/00*
U.S. Cl. 43—25 **6 Claims**



1. A fishing rod and reel combined with a device for preventing twist in fishing lines, said combination comprising:

a member having an opening extending therethrough, said opening having a substantially V-shape and tapered toward a central portion of said member;

said V-shaped opening in said member extending in a substantially sideward direction with respect to a plane defined by said fishing line and said rod;

said member further including a central slot defined by roughened surfaces communicating with said V-shaped opening at said central portion thereof;

means for attaching said member to said fishing rod at a point intermediate between said reel and the extremity of said rod with fishing line extending from said reel through

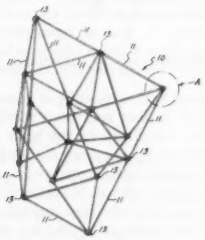
said V-shaped opening of said member to the extremity of said rod, said attaching means comprises a shaft extending substantially perpendicular to the center line of said V-shaped opening; and wherein

said fishing line moves across said surfaces of said member defining said V-shaped opening and into said slot when operation of said reel draws said fishing line taut.

3,927,489
RING ELEMENTS, CHANNEL ELEMENTS, AND CONNECTORS FOR JOINING SAME

Lawrence A. Bernstein, P.O. Box 651, Frederick, Md. 21701

Filed May 16, 1973, Ser. No. 360,785
Int. Cl.² A63H *33/10*
U.S. Cl. 46—29 **10 Claims**



1. A construction toy comprising:

A. a plurality of substantially rigid construction elements each comprising at least one hollow channel;

B. a plurality of connectors each comprising:

1. a stem at one end capable of extending into one of said channels and having a cross-section defined by surfaces that intersect to form longitudinal edges and being broader in one direction than in the direction perpendicular thereto, the maximum cross-sectional dimension of said stem being greater than the maximum cross-sectional dimension of said one of said channels to be frictionally held by the wall defining that channel, and

2. a head at the other end extending from the channel and formed with a circular aperture extending therethrough and opening at a margin of the respective head by way of a restricted slot that extends and opens laterally with respect to said stem, said head including a portion extending to one side of the longitudinal direction of said stem beyond one side of said channel in the same direction relative to said stem as said slot to form an abutment surface that engages said element to allow only said stem to enter said channel; and

C. a ring for joining at least two of said elements, said ring being forceable through said restricted slots into said apertures of the connectors attached to said elements to be joined, said ring having a cross-section dimensioned to be larger than said slots but both slidable and rotatable in said apertures so that the angular relationships of elements joined by said ring are universally variable.

3,927,490
TURKEY CALL

John T. Grayson, 103 Mount Vernon Drive, Bristol, Va. 24201

Filed Feb. 12, 1975, Ser. No. 549,292
Int. Cl.² A63H *5/00*
U.S. Cl. 46—189 **2 Claims**

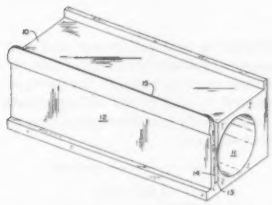
1. A turkey call comprising

A. a portion of appalachian red cedar, at least a part of the portion of appalachian red cedar comprised of red type wood,

B. the portion of appalachian red cedar having a cylindrical amplifying recess therein, the axis of symmetry of the amplifying recess being positioned substantially parallel to the grain of the appalachian red cedar, the amplifying recess having a diameter in the range of ¾ to 15/16 inches and a depth in the range of 3-½ to 4-½ inches,

C. the portion of appalachian red cedar having a plannar surface oriented parallel to the axis of symmetry of the amplifying recess,

D. the portion of appalachian red cedar having a slot therein, the slot being disposed between the amplifying recess and the plannar surface, the wall of the slot remote from the amplifying recess being defined by a first plane oriented parallel to the plannar surface and disposed from 0.070 to 0.090 inches from the plannar surface, the wall of the slot adjacent the amplifying recess being defined by a second plane oriented parallel to the plannar surface, the second plane being disposed from 0.080 to 0.106 inches from the first plane and a suitable distance from the axis of symmetry of the amplifying recess such that



the intersection of the cylinder defining the amplifying recess and the second plane define a rectangular passageway having a long dimension parallel to the axis of symmetry of the amplifying recess and a short dimension from 7/32 to ⅜ inches, the appalachian red cedar between the first and second plane being comprised of substantially red type wood,

E. the portion of appalachian red cedar having a striking region adjacent the region between the first plane and the parallel surface, the striking region being defined on one side by the first plane, the striking region being comprised of substantially red type wood,

F. first and second wood damping spacers bonded into the slot disposed between the amplifying recess and the plannar surface, the first and second damping spacers being disposed at opposite ends of the slot, the grain of the wood of the damping spacers being oriented substantially perpendicular to the grain of the portion of appalachian red cedar, and

G. an elongated piece of chalk adapted to strike the striking region and generate a turkey-attracting sound.

3,927,491
PROCESS AND APPARATUS FOR GROWING PLANTS

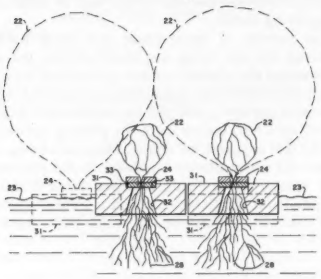
Robert S. Farnsworth, 1200 Lakeshore, No. 15H, Oakland, Calif. 94606

Filed Dec. 30, 1974, Ser. No. 537,198
Int. Cl.² A01G *31/02*
U.S. Cl. 47—1.2 **11 Claims**

1. A process for growing plants, which plants require a substantial lateral area relative to the plant stem for growth during mature plant stages and relatively insubstantial lateral area during seedling plant stages, comprising the steps of:

floating a plurality of plants by means of a plurality of separate raft means on a nutrient solution, each said raft means having sufficient buoyancy and stability for floating support of said plants and being adapted for communication of nutrient solution to said plants for growing of the same, said floating step including positioning of said

plurality of raft means in said nutrient solution in close proximity to each other for substantially maximum plant density per unit area of nutrient solution as determined by the larger of the lateral area of said raft means and the lateral area of said plants; and

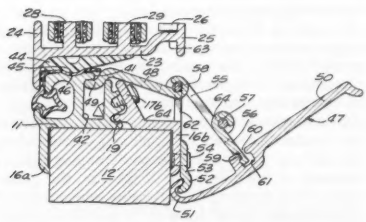


laterally displacing said raft means and said plants while increasing the total effective area of said nutrient solution in an amount corresponding to the increase of the lateral area required by said plants during growth while maintaining substantially maximum plant density per unit area of nutrient solution.

3,927,492
QUICK RELEASE HINGED VEHICLE WINDOW

Lawrence E. Carson, West Covina, Calif., assignor to Le Van Specialty Company, Inc., City of Industry, Calif.

Filed Sept. 16, 1974, Ser. No. 506,235
Int. Cl.² E05C *15/02, 11/00;* **F05B** *65/10*
U.S. Cl. 49—141 **15 Claims**



1. The combination in a quick release hinged vehicle window, comprising:

a. a fixed outer frame structure adapted to be mounted in a wall window opening;

b. an inner window supporting frame structure having a top hinged connection with a top portion of said fixed outer frame for permitting swinging movement of the inner frame structure between a position substantially coplanar with said outer frame structure and an angular position with its bottom outwardly spaced from the bottom of said outer frame structure;

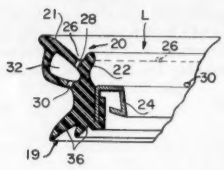
c. a manually operable articulated latching mechanism mounted on a bottom portion of said outer frame structure including a swingable latch bar having an outermost end movable into latching and non-latching positions with respect to a bottom portion of said inner frame structure in said coplanar position thereof; and

d. a separate swingable mounted actuating lever having an operative connection with said outermost end of said latch bar.

3,927,493
AUTOMOBILE COMPARTMENT DOOR WEATHERSTRIP

Norihiro Tsuneishi, and Yoshiyuki Miyabayashi, both of Tokyo, Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Jan. 8, 1974, Ser. No. 431,610
Claims priority, application Japan, Jan. 9, 1973, 48-5993
Int. Cl.² E06B *7/23*
U.S. Cl. 49—476 **2 Claims**



1. A weatherstrip for an automotive trunk structure, comprising:

a loop-shaped body extending in generally horizontal direction when in use, said body having a bottom surface disposed to sealingly fix the body to a flange of a door frame of a trunk, opposite a door for the trunk;

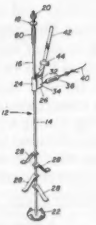
a tongue extending outwardly-upwardly from the loop-shaped body, integral therewith, and hollow so as to provide a cavity running longitudinally of the body and tongue, for sealingly contacting an inner panel of the trunk door, when in use and when the trunk door is closed; and

bulge means integral with the body and tongue and extending inwardly-upwardly from the tongue to define therewith, in use, a gutter running longitudinally of the body and cavity, with passageways distributed along the gutter, said passageways extending from said gutter into said cavity and therefrom to the outside of the loop, whereby water gathered in said gutter drains to locations outside of the loop-shaped body.

3,927,494
TENSIONABLE HOLD-DOWN ANCHORAGE APPARATUS

Francis L. Struben, Jarrettsville, Md., assignor to Silver Top Manufacturing Co. Inc., White Marsh, Md.

Filed Nov. 1, 1974, Ser. No. 519,952The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.
Int. Cl.² E04B *7/00*
U.S. Cl. 52—23 **7 Claims**



1. Apparatus for tensionably securing an object to the earth or the like, comprising:

rod means fixedly engageable with the earth and having a portion thereof extending thereabove;

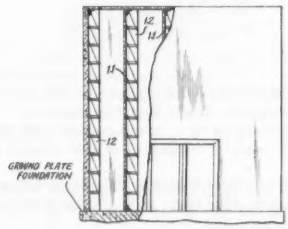
sleeve means slidable onto that portion of the rod means which extends above the surface of the earth, the sleeve means further being rotatable about the vertical axis of the rod means;

bracket means carried on the sleeve means;
said bracket means comprising a U-shaped channel having the longitudinal axis thereof parallel to the longitudinal axis of said rod means;
mounting means disposed in the bracket means;
securing means engageable at a first end thereof with the object to be secured and attachable at a second end thereof to the mounting means in said bracket means;
means for adjustably positioning the sleeve means on the rod means to tension the securing means between the object and the mounting means;
spring means disposed on the rod means between the sleeve means and the means for adjustably positioning the sleeve means acting to accommodate vertical motions of the object to be secured; and
earth anchoring means disposed on the rod means for engaging the earth and anchoring the rod means thereto, said anchoring means including a bottom base attached to the lower end of said rod means, and a plurality of spaced anchoring means disposed on said rod means in spaced fashion above said base and spreadable about the periphery of said rod means for anchoring said rod means in said earth.

3,927,495
WAREHOUSE WITH HIGH SHELVES

Walter Flosser, Schopfheim, Germany, assignor to Oehler-Wyhlen-Lagertechnik A.G., Aarau, Switzerland

Continuation-in-part of Ser. No. 307,876, Nov. 20, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 499,921
Claims priority, application Switzerland, Nov. 24, 1971, 535687/71
Int. Cl.² A47D *1/00*
U.S. Cl. 52—36 **2 Claims**

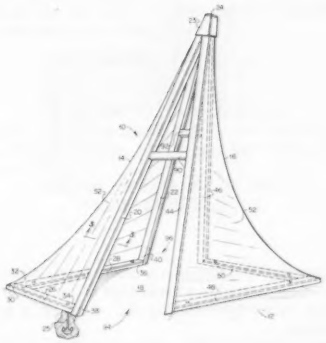


1. A high stack warehouse building consisting essentially of:
a ground floor foundation;
a roof;
concrete wall sections forming high stack storage shelves on said ground floor foundation;
storage shelves of steel construction connected to said concrete wall sections;
said concrete wall sections being separated from each other to form narrow alleys;
said concrete wall sections provided with lateral stiffening ribs supporting said roof and the wall taking up loads on the high stack storage shelves;
said wall sections being secured rigidly on all sides of said roof and said ground floor foundation;
said shelves taking up the individual loads of the goods stored thereon without providing any structural support for the building;
frames securing said wall sections;
each of said frames consisting of said ground floor foundation, said stiffening ribs for said wall sections and a portion of the roof;
said shelves including load carriers having an overhang and oblique struts to connect the associated wall section to the carriers;
projecting plates on said carriers which are secured by way of gussets to the carrier which carry the shelves on which pallets are supported;
a head plate arranged on each carrier which is secured on both sides of said carrier by screw-bolts in bores in the carrier for fastening said load carriers to the wall; and,
an intermediate plate which is inserted between the head-plate and the wall section.

3,927,496
METHOD FOR CONSTRUCTING A TENSILE-STRESS STRUCTURE AND RESULTANT STRUCTURES

Joseph A. Kersavage, 4022 Sequoyah Ave., S. W., Knoxville, Tenn. 37401

Filed Mar. 18, 1974, Ser. No. 452,363
Int. Cl.² E04B *1/32*
U.S. Cl. 52—80 **10 Claims**



1. A method for fabricating a tensile-stress structure having a surface of double-opposed curvature comprising the steps of erecting a substantially rigid open frame means defining the perimeter of said surface and comprising a terminal support for the respective ends of a plurality of elongated screen members spanning the space within said perimeter,
positioning an elongated screen member comprising a plurality of longitudinal strands, across said space defined by said terminal support,
aligning said screen member across said space with individual ones of said longitudinal strands thereof disposed along a substantially straight line,
tensioning said screen member in the direction of the length of said longitudinal strands,
anchoring the opposite ends of said screen member to said frame means,
applying successive elongated screen members across said space defined by said frame means with their respective adjacent side edges overlapping until said screen members collectively define said surface of double opposed curvature and,
closing the openings between the strands of said screen members with a semi-rigid material.

5. A tensile-stress structure having a surface of double-opposed curvature and comprising
a substantially rigid open frame member defining the perimeter of said curved surface,
a plurality of elongated screen members disposed across said space defined by said frame means in side by side relation with their adjacent side edges disposed in overlapping relation with each other and collectively defining said surface of double-opposed curvature, each of said screen members including a plurality of longitudinal and transverse strands, each of said screen members being tensioned in the direction of said longitudinal strands whereby each of said longitudinal strands extends in a

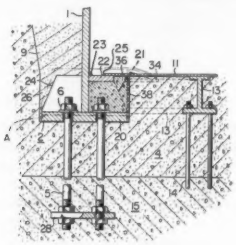
substantially straight line between spaced apart locations on said frame member,
means anchoring the ends of each of said screen members to said frame member, and
semi-rigid means closing the openings between said strands of each of said screen members.

3,927,497

SUPPORTING STRUCTURE OF PRESSURE VESSEL

Toshiaki Yoshinaga; Takanao Wada, and Kenji Matsuo, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 12, 1973, Ser. No. 414,747
Claims priority, application Japan, Nov. 15, 1972, 47-113898
Int. Cl. EO2d *27/00*; EO4b *1/92*
U.S. Cl. 52—169 **15 Claims**



1. A supporting structure of a pressure vessel comprising:
footing means secured to a lower edge of a side wall of said pressure vessel for installing the vessel on a concrete foundation,
said footing means including a base plate fixed on the lower edge of the side wall of said pressure vessel and a lining plate support member joined to the inner surface of said side wall so as to project therefrom,
liner support means installed in the concrete foundation inside the side wall of said pressure vessel,
a lining plate mounted on the liner support means and fixed to the lining plate support member at the edge thereof to form the bottom surface of the pressure vessel,
said lining plate and said lining plate support member having thereunder concrete for reinforcing them, and
a first means disposed adjacent to an inner edge of the base plate at an end thereof and to an under surface of the lining plate at the other opposite end thereof for permitting the concrete on the base plate inside the side wall of the vessel to be moved with the base plate, when an unusual pressure increase occurs in the pressure vessel,
said liner support means having means for relieving the stress produced in the lining plate when an unusual pressure increase occurs in the pressure vessel said relieving means being disposed at ends thereof facing said first means.

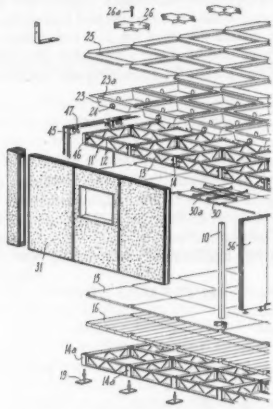
3,927,498

DEVICE FOR BUILDING CONSTRUCTION

Pierre Benedetti, Sarcelles, France, assignor to Sylvette Kirnisky, Sarcelles, France

Filed Nov. 28, 1973, Ser. No. 419,484
Claims priority, application France, Dec. 8, 1972, 72.43733
Int. Cl.² E04H *1/00*; E04B *1/19*
U.S. Cl. 52—236 **19 Claims**

1. A building structure for forming buildings of any plan configuration and of single or multiple stories by use of prefabricated elements forming modular space units, said building structure comprising:
at least two horizontally extending lattice networds, said lattice networks being vertically spaced from each other by a distance equal to a story of a building being constructed, the uppermost of said lattice networks forming roof supporting means for said building, the lowermost of said lattice networks forming floor supporting means for said building, each of said lattice networks comprising:
a plurality of vertically extending short posts;
a plurality of horizontally extending trussed beams, each having a height substantially equal to the height of said short posts; and
means for removably connecting opposite ends of said trussed beams to said short posts, said trussed beams extending from said short posts at substantially right angles to each other, thereby forming said lattice network;
a plurality of vertically extending main posts, each having a height equal to said distance, each said main post being



vertically aligned with and positioned between short posts of vertically adjacent of said lattice networks;
means for removably fixing opposite ends of each of said main posts to ends of respective of said aligned short posts;
said main posts and said trussed beams of said lattice networks forming modular space units of said building being constructed; and
a roof structure supported on said uppermost of said lattice networks; said roof structure comprising a plurality of tub-shaped elements each having flanged edges, said flanged edges being fitted over said trussed beams of said uppermost lattice network; channel members positioned over said flanged edges and secured to said trussed beams; sealing strips positioned between said channel members and said flanged edges; and means on said tub-shaped elements for collecting rain water.

3,927,499

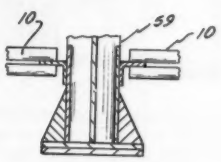
SPACE FRAME FLOOR COLUMN SYSTEM

Hristo V. Papayoti, Ann Arbor, Mich., assignor to Unistrut Corporation, Wayne, Mich.

Filed May 24, 1973, Ser. No. 363,365
Int. Cl.² E04B *5/43*
U.S. Cl. 52—263 **10 Claims**

1. The combination of vertically spaced load carrying floor and roof frameworks with an upright support column structure, each framework comprising a plurality of elongated stress and load transmitting struts interconnected by stress and load distributing connecting fixtures to define upper and lower gridlike chord frame structures disposed in spaced parallel planes, a plurality of elongated stress and load transmitting struts each connecting respectively with connecting fixtures of

the upper and lower chord frame structures to define a web structure intermediate said chord frame structures, and fastening means for connecting said struts to said connecting fixtures; said column structure extending from a lower support base through said floor framework to said roof framework and supportingly connected to said frameworks and being fastened to at least one connecting fixture in said floor framework and at least one connecting fixture in said roof framework to transmit loads of said frameworks directly to the base through said column structure while maintaining the load and stress transmitting and distributing characteristics of each framework independently unaffected, said column structure comprising:



at least one vertical column means;

a framework support assembly carried by said column means and extending substantially horizontally intermediate said upper and lower chord frame structures,

said framework support assembly comprising a horizontally extending arm, a pair of pedestals, means mounting one of said pedestals to the upper portion of said arm and means mounting said pedestal to a connecting fixture in said upper chord frame structure and means mounting the other of said pedestals to the lower portion of said arm and means mounting said pedestal to a connecting fixture in said lower chord frame structure.

3,927,500

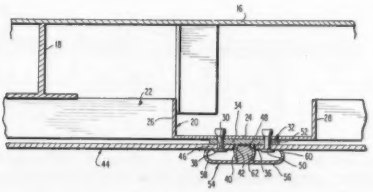
FIRE RESISTANT PANELING SYSTEM

Oscar M. Plumlee, Norfolk, Va. 23501

Filed Sept. 16, 1974, Ser. No. 506,539

Int. Cl.[2] E04B *1/92*; **E04F** *19/04*; **E04C** *1/34*

U.S. Cl. 52—460 **4 Claims**



1. In a paneling system for application to an area having a series of walls, said walls meeting at corners, the walls having a substructure, a floor, and a ceiling with a depending coaming at spaced intervals:

a plurality of channel form cribbing members secured in substantially vertical condition at spaced locations along said walls, with end cribbing members adjacent each of the corners, and horizontal floor cribbing members;

the cribbing members each having a bight portion and side arms, with the arms connected to the substructure of the walls at their distal extremities, and the bight portions disposed in parallel, outwardly spaced relation to the walls;

the bight portions having openings formed therein at selected locations;

back members extending vertically on the bight portions of the cribbing members, the back members each comprising a plate having plate openings therein aligned with the openings in the bight portions, and having a pair of outwardly projecting prongs;

said prongs having first sections outwardly angled from the plate relative to one another and second sections angled toward one another and together comprising a spring clip;

a series of panels comprising metallic plates with a laminated, fire resistant coating thereon, said panels having ends which abut the first sections of the prongs and extend between adjacent back members;

the panels having holes formed therein in alignment with the openings and the plate openings; rivets extended through said aligned openings, plate openings and holes, clampingly engaging the panel ends and back members to the bight portions; and

a face member for each back member, the face members comprising a cover having a flat, vertically elongated section and curved side sections, and a central plug engaged by the spring clip, said plug having side walls with outer portions angled to conform to the first sections of the prongs and inner portions angled to conform to the second sections of the prongs.

3,927,501

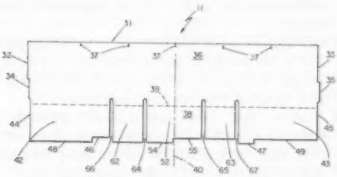
RANDOM PATTERN SHINGLE

Herman C. Allen, Cumberland, R.I., and Clifford J. Patenaude, Plainville, Mass., assignors to Bird & Son, Inc., East Walpole, Mass.

Filed Jan. 15, 1975, Ser. No. 541,283

Int. Cl.[2] E04D *1/26, 1/36*

U.S. Cl. 52—555 **12 Claims**



1. A strip shingle adapted to be laid on a roof with other identical strip shingles in overlapping superposed courses in a predetermined assembly with adjacent superposed courses laterally offset to simulate the appearance of random width and multiple length wood shingles

said strip shingle having

side butt edges

an upper unexposed area and

a lower exposed area with a lower edge

said strip shingle having in said exposed area and said lower edge at least two slots defining at least three tabs including outer tabs and at least one intermediate tab therebetween

said outer tabs being of width greater than said intermediate tab

the lower edges of at least some of said tabs including said outer tabs being defined by two discrete long and short tab lengths

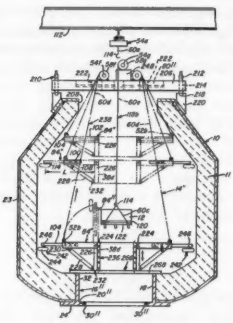
one of said outer tabs, at its end adjacent a said intermediate tab, having a narrow width tab portion of long length with the remainder of said outer tab being of short length and the other of said outer tabs, at its end adjacent a said intermediate tab, having a narrow width tab portion of short length with the remainder of said outer tab being of long length

said slots in a plurality of said courses being out of vertical alignment with one another.

3,927,502
METHOD OF LINING A FURNACE

Joe H. Smith, Bluff Park, Ala., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 253,217, May 15, 1972, Pat. No. 3,853,204. This application Feb. 15, 1974, Ser. No. 443,055
Int. Cl.² E04G 21/00
U.S. Cl. 52—747 31 Claims



1. A method of lining a furnace, provided with a bottom aperture in its bottom and a top aperture in its top, with an inner lining of a refractory material, said method including the steps of:

a. securing a table support member to said furnace adjacent said top aperture of said furnace;

b. moving a work platform through said bottom aperture in said furnace to a desired work position within said furnace;

c. moving said work platform from a storage position, where said work platform passes through said bottom aperture in said furnace, to a work position where a workman is able to stand on said work platform;

d. moving said refractory material through a refractory material aperture in said work platform into alignment with said work platform so that said refractory material can be transferred to said work platform;

e. transferring said refractory material to said work platform;

f. rotating said work platform and a turntable on said table support member to align said work platform with an inner portion of said furnace where said inner lining of said refractory material is to be applied; and

g. applying said refractory material to said inner portion of said furnace.

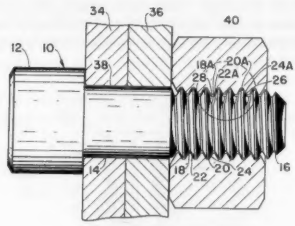
3,927,503
PREVAILING TORQUE FASTENER

Charles A. Wilson, Williamstown, N.J., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Dec. 26, 1973, Ser. No. 428,112
Int. Cl.² F16B 5/02, 39/30
U.S. Cl. 52—758 F 30 Claims

10. A joint assembly comprising a plurality of workpieces having an opening extending therethrough, a threaded fastener including a shank portion having an external thread formed thereon with a normally load bearing flank and a normally non-load bearing flank and an internal thread configuration having a mating thread generally complementary to said external thread, the improvement comprising:

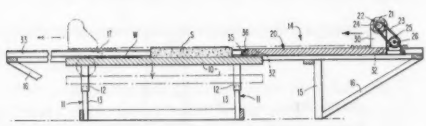
a locking portion formed on said external thread including an axially displaced thread segment relative to the remainder of said external thread having an axially displaced root and an entire crest being axially displaced adjacent said displaced root, wherein said displaced crest is axially thicker than the crest of said external thread, and wherein the surface of said locking portion includes a first surface flank portion adjacent said displaced crest for bearing on a portion of said mating thread causing a deformation of said internal thread adjacent its minor diameter without substantially deforming said mating thread between its pitch diameter and its major diameter, and a second surface flank portion relieved from said first surface flank portion intermediate said displaced root and said first surface flank portion, said locking portion being non-symmetrically disposed on the circumference of one segment of said external thread.



3,927,504
APPARATUS AND METHOD FOR PRODUCING A COMPRESSED, ROLLED PACKAGE OF RESILIENT MATERIAL

John J. Forrister, 6348 E. Gage Ave., Bell Gardens, Calif. 90201

Filed Sept. 4, 1974, Ser. No. 503,482
Int. Cl.² B65B 11/56, 63/02
U.S. Cl. 53—21 FW 9 Claims



6. In a method of making a compressed, rolled package of resilient, compressible foamed sheet material, the steps which comprise:

a. supporting said material on a substantially flat support,

b. advancing a cylindrical roller from a remote position along said support toward and into rolling pressure engagement over the front portion of said material, compressing said front portion of said material under said roller and causing the compressed front portion of said material behind said roller to curl up against the trailing surface of said roller,

c. advancing behind said roller toward said material and into pressurized engagement therewith a carrier having a leading edge that is spaced above the level of said support at a distance less than the thickness of said material,

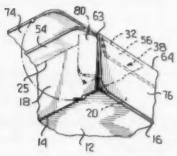
d. folding over upon itself the curled up compressed front portion of said material under said front edge of said carrier, and

e. continuing the advancement of said carrier to compress said material beneath said leading edge and then roll up said material to form a compressed rolled package.

3,927,505
METHOD OF FORMING, FILLING AND CLOSING CARTONS, AND SPECIFIC CARTONS THEREFOR

Robert P. Bemiss, 925 Vista Road, Hillsborough, Calif. 04010

Division of Ser. No. 347,411, April 3, 1973, Pat. No. 3,812,612. This application Mar. 20, 1974, Ser. No. 453,087
Int. Cl.² B65B 7/00
U.S. Cl. 53—37 3 Claims

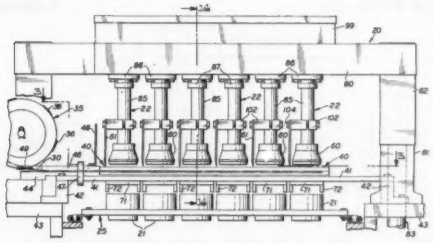


1. A packaging method comprising the steps of providing a carton blank defined by a bottom panel, four upstanding side panels and a flange carried by each side panel, setting up the carton blank into a carton body with the side panels generally normal to the bottom panel and the flanges, conveying the carton body along a predetermined path in a predetermined direction, packaging a product within the carton body, spanning the carton body including the flanges thereof with a cover having a top panel and a flange overlying and projecting beyond each carton body flange, folding all flanges directly against associated side panels of the carton body, and adhesively securing the cover flanges directly to, against and entirely covering the associated side panels at an area below each body flange whereby the body flanges are thereby held in direct sandwiched relationship between the associated cover flanges and carton body side panels.

3,927,506
FEEDER, SHEARER AND APPLICATOR FOR A STRIP OF CONNECTED PAPER CAPS

Ahmed M. E. Abd-Alla, Westerville, Ohio, assignor to Big Drum, Inc., Columbus, Ohio

Filed Apr. 17, 1974, Ser. No. 461,529
Int. Cl.² B65B 7/28
U.S. Cl. 53—41 14 Claims

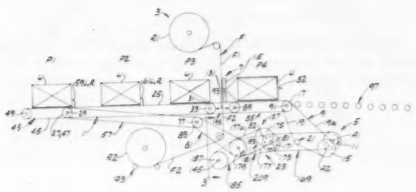


1. The method of capping a plurality of containers siumultaneously which comprises providing a series of caps in strip form in which the individual caps are connected to each other at successive transverse lines, supporting a plurality of the containers as a row of successive containers with their mouths exposed for receiving the caps, feeding the strip of caps into association with the mouths of the containers with the center line of the strip aligned with the centers of the container mouths and with tranverse lines of the strip disposed in leading and trailing relationship to each of the successive container mouths of the row so that the respective caps of the strip are in alignment with the mouths, shearing the strip at the successive connecting lines between the caps after they are aligned with the container mouths by first impaling the strip at each successive transverse line and at the center line of the strip to stabilize it laterally and longitudinally and then shearing it simultaneously laterally in both directions from the impaling point gradually and progressively outwardly to the opposed outer edges of the strip at said transverse lines while concurrently displacing the cap perpendicularly to the plane of the strip prior to completely separating the cap, and applying the separated caps to the aligning mouths of the containers.

3,927,507
PACKAGING APPARATUS

Laurie M. Reid, Birmingham, Ala., assignor to Master Packaging Equipment, Inc., Trussville, Ala.

Filed Jan. 23, 1974, Ser. No. 435,731
Int. Cl.² B65B 9/12
U.S. Cl. 53—182 8 Claims



1. Packaging apparatus comprising means for feeding forward units to be wrapped and flexible packaging material for wrapping the units, with the units spaced apart in the direction of feed, means for effecting intermittent operation of the feeding means intermittently to feed forward the units and the packaging material, with a dwell interval between successive feed cycles, and means for forming a seal across the width of the material between two successive units during each dwell interval, wherein said means for operating the feeding means comprises a chain and sprocket drive including a crank rotatable about a predetermined axis, means for continuously rotating the crank in one direction about its said axis, a first sprocket secured to the crank with the axis of said first sprocket offset from the crank axis for rotation of said first sprocket about the crank axis without rotation of said first sprocket about its own axis, a second sprocket connected to said feeding means, a chain trained around said first and second sprockets, said first sprocket acting to pull a reach of the chain in a forward direction to effect rotation of the second sprocket in a forward direction for driving said feed means during a first portion of a revolution of said first sprocket about the crank axis, and to discontinue froward drive of the chain during a second portion of said revolution for a feed and dwell of the feed means during each revolution of the crank, means for maintaining the chain relatively taut around said sprockets, and means driven in timed relation to said first sprocket for operating said seal forming means to form a seal as the first sprocket rotates through said second portion of a revolution.

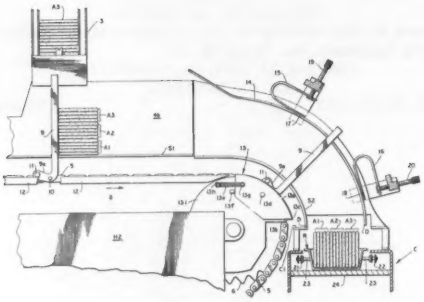
3,927,508
ARTICLE LOADING MACHINE

William A. Campbell, III, Athens, Ga., assignor to Quality Food Machinery Inc., Athens, Ga.

Filed Apr. 10, 1975, Ser. No. 566,784
Int. Cl.² B65B 5/06, 35/50
U.S. Cl. 53—251 13 Claims

1. A machine for manipulating a vertical stack of articles into horizontal disposition said machine comprising support means having a generally horizontal article supporting portion and a downwardly projecting article manipulating portion, a flexible endless element arranged to move along a path a part of which is generally parallel to and adjacent said article manipulating portion of said support means, a feeder lug

pivotally mounted on said endless element, a cam follower mounted on said feeder lug, a cam having a cam surface adjacent said endless element and generally parallel to the article manipulating portion of said support means, said cam surface being engageable by said cam follower so as to hold said feeder lug approximately normal to said article manipulating portion of said support means for engaging and moving



the articles therealong, said cam being configured to allow said feeder lug to swing about its pivotal mounting from its normal disposition relative to said manipulating portion of said support means to a position approximately tangent thereto and means yieldably mounting said cam so as to accomodate predetermined swinging movement of said lug about its pivotal mounting which is in a direction generally opposite to article feeding movement thereof.

3,927,509

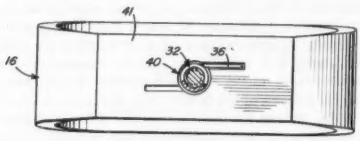
AUTOMATIC IN-PLACE STIRRUP

Fred A. Riebold, P.O. Box 314, Central, N. Mex. 88026

Filed May 30, 1974, Ser. No. 474,861

Int. Cl.² B68C *3/00*

U.S. Cl. 54—48 **10 Claims**



1. A stirrup assembly comprising, in combination:

a. a stirrup;

b. pin means for attachment to the loop of a stirrup leather; and

c. revolving means connecting the pin means to the stirrup for normally retainingly biasing the stirrup into a predetermined position, the revolving means including:

i. a substantially U-shaped member having an elongated back element and a pair of substantially parallel legs connected to ends of and extending codirectionally from the back element; and

ii. resilient means including a torsion spring connected to the back element and the stirrup for rotatably biasing the stirrup and the back element toward a predetermined stable relationship with respect to one another.

3,927,510

GRASS-CUTTING DEVICES

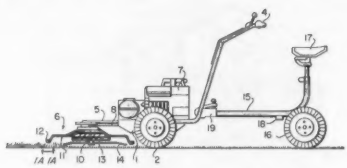
Lennart Oswald Arnblock, Vellinge, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland

Filed Mar. 14, 1974, Ser. No. 451,109

Claims priority, application United Kingdom, Mar. 27, 1973, 14591/73

Int. Cl.² A01D *35/264*

U.S. Cl. 56—12.8 **3 Claims**



1. A grass-cutting device with a self-propelling drive unit having two wheels on a common axis, comprising in combination, drive unit structure providing a center of gravity located substantially in a vertical plane extending through the common axis of the wheels, a two-wheeled trailer unit for carrying a person with structure adapted to distribute substantially the entire weight of the trailer unit and the person to the wheels of the trailer unit, means pivotably attaching the trailer unit to the drive unit to allow vertical relative movement between the trailer unit and the drive unit, a cutter unit supportable on a cushion of air, and means attaching the cutter unit to said drive unit at a horizontal distance forward of said drive unit wheel axis with a member allowing the weight of the cutter unit to tilt said drive unit forwardly tending to carry the cutter unit toward the ground.

3,927,511

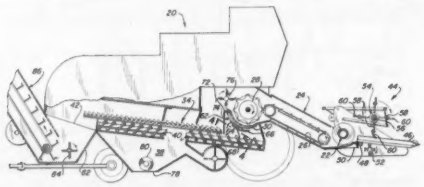
METHOD AND APPARATUS FOR HARVESTING COTTON

James D. Burris, P.O. Box 72, and Bobby V. Burris, P.O. Box 164, both of Muleshoe, Tex.

Filed Oct. 23, 1973, Ser. No. 408,411

Int. Cl.² A01D *46/12*

U.S. Cl. 56—33 **7 Claims**

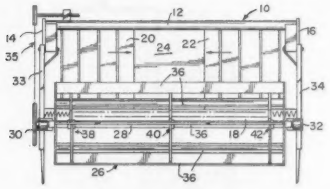


1. The method of harvesting cotton by the use of a combine of conventional construction having a platform, a feeder house and separation means including a cylinder-concave thresher straw-walker-blower combination, said method comprising the steps of stripping cotton bolls from the stalks onto the platform and feeding the stripped bolls through the feeder house to the separating means, operating the separating means to pulverize the stem portions and other trash stripped with the boll into relatively small grain sized particles, feeding said grain sized particles into a first discharge system of the combine while feeding the cotton fibers into a second discharge system of the combine, and collecting the cotton fibers as they are discharged from the second discharge system of the combine.

3,927,512
HARVESTER REEL

Herbert W. Molzahn, Hamilton, Canada, assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 2, 1972, Ser. No. 277,183
Int. Cl.² A01D *57/02*
U.S. Cl. 56—220 **12 Claims**



1. A harvester reel for engaging a standing crop and having a longitudinally extending rotatable shaft of polygonal cross section and a plurality of crop-engaging bats circumferentially spaced about the shaft for revolving about the longitudinal axis of the shaft as the shaft is rotated, wherein the improvement resides in means for supporting the bats from the shaft, comprising:

first and second disk assemblies adapted for mounting on said shaft and each including a pair of disk sections secured together in diametrically opposed relation about said shaft with a fit complementary to the polygonal cross section of said shaft, said disk assemblies being disposed in closely axially spaced relation on said shaft;

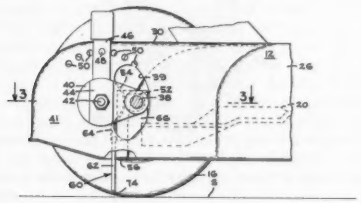
bat-support structure secured between said disk assemblies and extending radially outwardly from said shaft; and

means coupling said bats to said bat-support structure.

3,927,513
SAFETY SHIELD FOR ROTARY MOWER

Dudley D. Ramaker, Cedar Grove, and Roger W. Keller, Port Washington, both of Wis., assignors to FMC Corporation, San Jose, Calif.

Filed May 20, 1974, Ser. No. 471,270
Int. Cl.² A01D *75/20*
U.S. Cl. 56—320.1 **4 Claims**



1. In a rotary lawnmower of the type including a cutting blade within a mower housing which is vertically adjustable relative to two laterally opposed rearward ground support wheels mounted on opposite ends of transverse axle means defining the axis of rotation of said wheels, the improvement comprising:

a safety shield disposed between said opposed support wheels for blocking movement of objects therepast toward and away from the cutting blade,

a rearwardly extending portion of said mower housing disposed behind said blade,

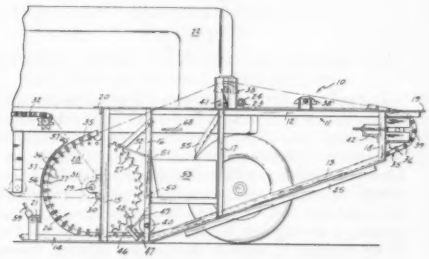
means mounting said safety shield in depending relation from said axle means for pivotal movement about said axis of rotation, said safety shield having a lower edge closely spaced from the ground and maintaining said spacing regardless of the adjusted height of the mower housing by reason of its pivotal mounting on said axle means, and,

said mounting means comprising a bracket rigidly secured to each end portion of said safety shield and freely pivotally mounted on said axle means, said safety shield being connected to said brackets at positions rearwardly offset from a vertical plane having said axis of rotation therein for overbalancing said safety shield causing the lower edge thereof to pivot about said rotational axis toward the cutting blade and into contact with said rearwardly extending portion of said housing disposed between said cutter blade and said shield, thereby to resist intrusion of an object toward said cutting blade and likewise said shield in being weighted toward said housing resists outward deflection by objects thrown rearwardly by said cutter blade.

3,927,514
SELECTIVE ASPARAGUS HARVESTING UNIT

Aaron F. Sammet, Princeville, Ill., assignor to Martin Farms Partnership and Joan of Arc Company, both of Princeville, Ill., part interest to each

Filed Mar. 28, 1974, Ser. No. 455,782
Int. Cl.² A01D *45/00*
U.S. Cl. 56—327 A **17 Claims**



1. A unit for selectively harvesting asparagus shoots as the unit is transported across an asparagus plant, said unit comprising:

a frame having a plurality of members interconnected to form a front end, a rear end, a lower frame portion adjacent the rear end, and means for supporting the frame on a transporting device with the lower frame portion adjacent the ground surface;

means disposed on the frame for selectively snapping shoots from their plants;

means disposed on the frame for receiving the snapped shoots; and

means disposed on the frame for conveying the snapped shoots from the snapping means to the receiving means; said means for selectively snapping including a plurality of rod members interconnected in a closed loop with the rod members being substantially equally spaced and being substantially parallel, means for supporting and moving the closed loop in a continuous path, said path having an inclined portion extending from adjacent the front end downward toward the lower frame portion and a segment extending upward from the lower frame portion, and said means for selectively snapping including means disposed on the frame within the loop adjacent the segment and the inclined portion of the path for engaging an asparagus shoot which extends at least a predetermined distance between and beyond the rod members, said means for engaging coacting with the rod members to snap the shoot from the plant without snapping any shoot which does not extend to said predetermined distance so that the shoots of at least a predetermined height are harvested while shorter shoots are left unharvested as the unit moves thereover.

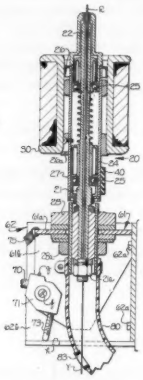
3,927,515
APPARATUS FOR PRODUCING WRAPPED YARNS

Francis B. Northup, and Donald R. Hart, both of Sanford, N.C., assignors to Spanco Industries, Inc., Sanford, N.C.

Continuation-in-part of Ser. No. 279,944, Aug. 11, 1972, Pat. No. 3,831,369. This application July 15, 1974, Ser. No. 488,809

Int. Cl.² D02G 3/28; D01H 1/241

U.S. Cl. 57—18 13 Claims



1. Apparatus for producing helically wrapped staple fiber yarns comprising a frame, a drafting unit carried by said frame and having a pair of delivery rolls defining a nip therebetween for delivering therefrom at least one drafted strand of staple fibers, a rotatable spindle having a free end and also having an axially extending passageway therethrough communicating with said free end for guiding the drafted strand through the spindle, a driving belt for rotating said spindle, said spindle being adapted to receive thereon for rotation therewith a spool having a binder strand wound thereon for wrapping the binder strand around the drafted strand being delivered to the spindle by the delivery rolls, spindle mounting means carried by said frame and normally supporting said spindle in a predetermined operative rotating position in engagement with said driving belt and with the free end of said spindle located closely adjacent the nip of said delivery rolls for facilitating directing the drafted strand through said spindle passageway and for wrapping the drafted strand closely adjacent the delivery rolls, and means operatively associated with said mounting means to selectively move said spindle relative to said delivery rolls and between said predetermined operative rotating position and a predetermined inoperative non-rotating position in which said spindle is spaced away from said driving belt and away from the delivery rolls to permit doffing and donning spools over the free end of the spindle.

3,927,516
MACHINE FOR CONTINUOUS SPINNING BY MEANS OF SPINNING ROTORS

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Mar. 21, 1974, Ser. No. 453,500

Claims priority, application Germany, Mar. 22, 1973, 2314229

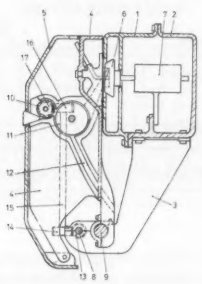
Int. Cl.² D01H 1/12

U.S. Cl. 57—58.89 14 Claims

1. A spinning machine comprising:

at least one spinning unit, each of said spinning units including spinning means, a drivable supply roller for assisting in supplying fibrous material to said spinning means, and a swivel housing which is pivotable about a swivel axle and which carries said supply roller,

a longitudinal drive shaft extending adjacent said at least one spinning unit and including a driving gear for each of said at least one spinning units, said drive shaft being spaced from the respective swivel axles of said swivel housings,



and supply roller drive transmission means for transmitting rotational movement of said drive shaft to respective ones of said supply rollers, said transmission means including a driven gear carried by each of said swivel housings which is selectively drivingly engageable with said driving gear in dependence on the position of the respective swivel housing.

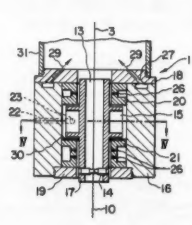
3,927,517
TWISTER DEVICE FOR PRODUCING CRIMPED FILAMENTARY YARNS

Hisashi Kimoto, Osaka, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed June 27, 1974, Ser. No. 483,618

Int. Cl.² D01H 7/92; D02G 1/04

U.S. Cl. 57—77.45 5 Claims

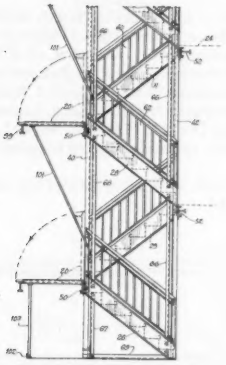


1. A twister device for producing crimped yarns comprising a turbine blade rotary member including a twister pin for an introduced filamentary yarn disposed in the interior of a hollow shaft thereof and blades projected stepwise on the circumference at the middle portion thereof and a casing disposed to enclose the outer periphery of the rotary member, wherein a gas-projecting opening for supplying a compressed gas to the blades of the rotary member and imparting a rotating power to the rotary member and another gas-projecting opening for supplying a compressed gas to both the ends of the stepped portion of the hollow shaft and supporting the rotary member in the floating state are mounted in the interior of the casing separately from each other, and further including a plurality of gas-projecting openings opened with an inclination with respect to the filamentary yarn to be crimped provided on the yarn introducing side of the casing.

3,927,518
SITE ASSEMBLED MULTI-STORY STAIR

Smith H. Simmons; Otho A. William, both of Largo, and Arthur E. Miller, Tampa, all of Fla., assignors to Metal Service Company, Inc., Clearwater, Fla.

Filed Aug. 29, 1974, Ser. No. 501,804
Int. Cl.² E04F *11/02*
U.S. Cl. 52—183 **5 Claims**



1. A prefabricated stair unit shipped disassembled to a construction site for field assembly and installation on a field jig, comprising:

a. at least one pair of prefabricated stair flights;

b. headers for bolting to the ends of each flight of stairs and dimensioned to provide an anchoring portion for permanently anchoring said unit in an installed position;

c. newels field bolted to said pair of stair flights and extending vertically to provide permanent internal support for said unit;

d. a platform for each pair of stair flights mounted by field bolting and movable between a vertical position maintained during installation and a horizontal position for permanent use as a landing; and

e. a plurality of temporary supports field bolted to said pair of stair flights during field assembly and removed after installation, said supports located wholly within the stair unit and extending vertically between the outer extremities thereof for temporarily supporting the stair flights in their assembled relation to permit permanent installation, said supports maintaining the flights in a laterally spaced opposite running relation with the upper end of one flight and the lower end of the other flight alongside one another at about midway between the height spanned by the flights.

3,927,519
TIMEPIECE MOVEMENT WITH A TIMER MECHANISM

Francois Berthoud, Le Lieu, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services SA, Bienne, Switzerland

Filed Dec. 9, 1974, Ser. No. 531,074
Claims priority, application Switzerland, Dec. 7, 1973, 17226/73
Int. Cl.² G04F *7/04*
U.S. Cl. 58—76 **15 Claims**

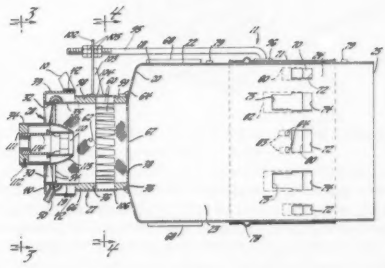
1. A time piece movement comprising a frame, a time-recording member, a timing element with a balance and a balance-spring, and a mechanism for starting, stopping, and returning said time-recording member to zero, said mechanism comprising a control part connected to said frame by a sliding link and having a control finger, two controlled parts consisting of a balance flirt and a navette for actuating the return-to-zero of said time-recording member, a control spring, a push piece acting onto said link for sliding it, thereby displacing said control part from a resting position into an active position against the action of said spring, and force

applying means for applying the force of said spring to said control part along a line which in said resting position passes alongside said link, said control part being subjected by said spring and by said push-piece to a torque which presses said control finger against one of said controlled parts.

3,927,520
COMBUSTION APPARATUS WITH COMBUSTION AND DILUTION AIR MODULATING MEANS

John R. Arvin, Indianapolis; Robert E. Sullivan, and Dennis L. Troth, both of Speedway, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 4, 1974, Ser. No. 439,647
Int. Cl.² F02C *9/00*; **F02G** *3/00*
U.S. Cl. 60—39.23 **4 Claims**



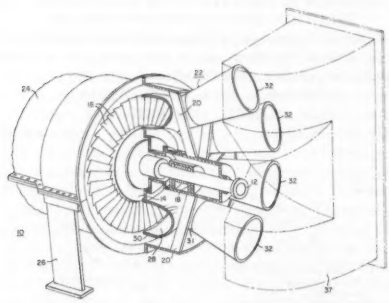
1. A combustion apparatus adapted for use in a gas turbine engine characterized by substantially complete combustion of liquid hydrocarbon fuel and by a low output of nitrogen oxides, the apparatus comprising a combustion liner having a discharge outlet for combustion products at the downstream end of the liner; the liner having an upstream end and liner wall means extending from the upstream end to the downstream end, the wall means enclosing, in sequence from the upstream end to the downstream end, a prechamber, a reaction zone, and a dilution zone; the prechamber including first air entrance means at its upstream end effective to direct combustion air with a substantial transverse velocity component downstream over the inner surface of the prechamber wall means, liquid fuel introduction means downstream of the swirler means disposed to lay a film of liquid fuel on the said inner surface for evaporation by and mixture with the said combustion air, and second air entrance means through the prechamber wall means near the downstream end of the prechamber adapted to introduce air to dilute the fuel-air mixture, wherein the improvement comprises a structure of the

second air entrance means providing a ring of air entrance ports extending radially through the prechamber wall means distributed around the prechamber, the ports having a configuration including lateral walls substantially inclined to the radial direction such as to introduce the air radially into the prechamber with a substantial circumferential component of motion in the same direction as the transverse velocity component of the air flowing from the first entrance means and no significant axial component of velocity relative to the axial component of velocity of the fuel-air mixture, the ports being tapered axially of the prechamber, and comprises means for varying the flow capacity of the second air entrance means including a sleeve surrounding and reciprocable axially of the prechamber wall, the sleeve having V-notched edge portions cooperating with at least some of the ports so as to provide graduated modulation of the flow area during initial opening and final closing movement of the sleeve.

3,927,521
MULTICONE EXHAUST DIFFUSER SYSTEM FOR A GAS TURBINE

Birger O. Hugoson, Wallingford, and Carl A. Rohr, Springfield, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1974, Ser. No. 433,960
Int. Cl.² F02C *7/20;* **F01D** *25/24*
U.S. Cl. 60—39.31 **5 Claims**



1. In a gas turbine installation including: a housing, a shaft rotatably mounted in said housing by means including a downstream bearing, alternating annular arrays of stationary and rotatable blades, said rotatable blades being attached to said shaft, a hot motive fluid flow path within said housing, the hot motive fluids driving said rotatable blades, an inlet in said turbine for the hot motive fluid, and a hot motive fluid exhaust outlet arrangement for the hot motive fluid, said hot motive fluid exhaust outlet arrangement comprising:

an annular chamber downstream of the last array of said rotatable blades,

a plurality of generally axially disposed transition members in registration with said annular chamber,

an annular array of a plurality of tubular-shaped generally axially directed hot motive fluid exhaust ducts, each in fluid communication with one of said transition members, said ducts being generally comprised of truncated diffuser cones, the smaller diameter of said truncated cones mating with said transition members,

a plurality of downstream bearing support members disposed between adjacent exhaust ducts, said bearing support members extending between said bearing and said housing,

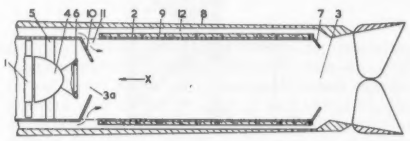
said hot motive fluid exhaust ducts being detachable from said transition members, to permit access to the bearing and blade assemblies, said bearing support members being free from contact with the hot motive fluid exhaust to limit any thermal effects therein,

a pair of exhaust hoods attached to the downstream ends of said diffuser cones with an expansion joint therebetween, each of said exhaust hoods directing the flow of the hot motive fluid exhaust away from the gas turbine, each of said exhaust hoods having an array of half of said plurality of diffuser cones attached thereto.

3,927,522
AIRCRAFT GAS TURBINE NOISE SUPPRESSION

William Dean Bryce; Richard Alfred Pinker, both of Farnham, and Brian Arthur Turner, Aldershot, all of England, assignors to The Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England

Filed Dec. 17, 1973, Ser. No. 425,235
Claims priority, application United Kingdom, Dec. 18, 1972, 58304/72
Int. Cl.² F02K *3/04, 3/02;* **E04B** *1/99;* **B64D** *33/04*
U.S. Cl. 60—264 **4 Claims**



1. A gas turbine engine comprising a turbine; a jet pipe extending downstream of the turbine and terminating in a primary nozzle, conditions at which affect the operation and efficiency of the engine in normal flight conditions, the length of the jet pipe downstream of the turbine being at least equal to the primary nozzle diameter; and a plurality of members adjacent the turbine upstream of said primary nozzle and moveable between positions corresponding to normal flight conditions where they lie parallel to the centerline of gas flow through the pipe and positions where they extend at an angle to the gas flow to form a serrated restriction to flow through the pipe, said members when not extended forming a secondary nozzle of larger area normal to flow therethrough than the area normal to flow through said primary nozzle and when extended forming a secondary nozzle of smaller area normal to flow therethrough than the area normal to flow through said primary nozzle so that conditions at the secondary nozzle and not conditions at the primary nozzle affect the operation and efficiency of the engine and so that the gas flow through the secondary nozzle is substantially divided into a plurality of separate flow streams, the jet pipe downstream of the secondary nozzle becoming a shield for noise emanating from the secondary nozzle.

3,927,523
EXHAUST CLEANING SYSTEM FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

Giichi Shioyama, Yokosuka; Kenji Masaki, Yokohama, and Shuya Nambu, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 6, 1974, Ser. No. 448,638
Claims priority, application Japan, Mar. 13, 1973, 48-29220
Int. Cl.² F02B *75/10*
U.S. Cl. 60—278 **4 Claims**

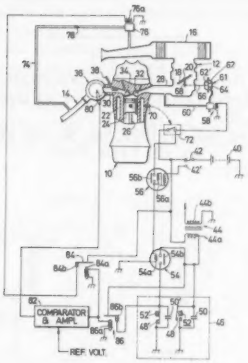
1. In an automotive internal combustion engine having an air inlet and exhaust outlet; exhaust cleaning means connected to said exhaust outlet for reducing toxic compounds in the exhaust gases; and a rapid engine warming system including delayed spark advance breaker points in an ignition distributor and control means for establishing connection between said delayed spark advance breaker points and an ignition

power source when the engine temperature is lower than a first predetermined level; the improvement which comprises:

an exhaust recirculation passageway leading from the outlet of said exhaust cleaning means to said air inlet;

electrically energizable valve means disposed in said exhaust recirculation passageway for opening the passageway when energized;

sensing means responsive to the temperature of said exhaust cleaning system for producing an electrical signal when



the temperature of said exhaust cleaning system is lower than a second predetermined level;

first switch means for energizing said valve means in response to said electrical signal; and

second switch means responsive to said electrical signal for providing a circuit between said delayed spark advance breaker points and said ignition power source to render said delayed spark advance breaker points effective to retard the ignition timing of said internal combustion engine.

3,927,524

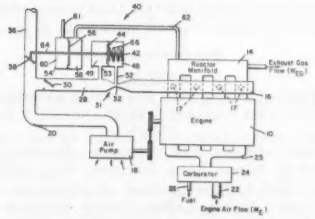
ENGINE EXHAUST REACTOR AIR FLOW RATIO CONTROL METHOD AND APPARATUS

Robert L. Cholvin, Santa Monica, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 22, 1974, Ser. No. 445,000

Int. Cl.² F02B *75/10*; **G05D** *11/00*

U.S. Cl. 60—289 **15 Claims**



1. Air flow control apparatus for an internal combustion engine having an exhaust manifold reactor comprising:

pump means adapted to be driven by the engine for supplying secondary pressurized air to the reactor;

conduit means connected to said pump means for conveying the pressurized air, said conduit means having a portion for venting the pressurized air to atmosphere;

air passage means connected to said conduit means intermediate said pump means and said portion and adapted for connection to convey a portion of the pressurized air as secondary air to the exhaust manifold reactor;

valve means positioned in said conduit means portion for regulating flow of the pressurized air to atmosphere;

a venturi positioned in said air passage means;

a first housing;

a first diaphragm positioned in said first housing to provide first and second chambers, said first chamber being connected to the throat of said venturi and said second chamber being connected to said air passage means immediately upstream of said venturi:

a second housing; and

a second diaphragm positioned in said second housing to provide third and fourth chambers, said second diaphragm being connected to said first diaphragm and said valve means for simultaneous movement, said third chamber being adapted for connection to the exhaust manifold reactor, and said fourth chamber being connected to the atmosphere.

3,927,525

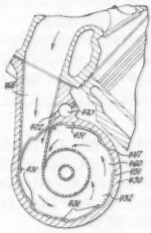
ENGINE WITH EXHAUST MANIFOLD CONVERTER-REACTOR

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1973, Ser. No. 364,154

Int. Cl.² F01N *3/16*

U.S. Cl. 60—301 **1 Claim**



1. An exhaust converter-reactor for an internal combustion engine, said converter-reactor comprising

a cast generally tubular housing defining internally an elongated cylindrical chamber having at one end an end wall with a central opening

means at said one end of the housing defining a downwardly directed outlet passage connected through said end wall opening with the end of said chamber and providing means for connecting an exhaust conduit thereto,

a removable cap secured to the other end of said cast housing from said outlet passage and closing the adjacent end of said chamber,

a tubular ceramic insulating liner within and extending longitudinally the length of said chamber, said liner having a plurality of ribs engaging the inner walls of said housing and maintaining the main body of said liner in closely spaced relation with the housing walls to reduce heat transfer thereto,

a tubular catalytic element for NO_x reduction extending longitudinally through said chamber within said liner and spaced therefrom to divide said chamber longitudinally into generally concentric inner and outer sections, said catalytic element extending into said central opening at said housing one end and being supported therein by said end wall, and means on said cap receiving and supporting said catalytic element at said housing other end, said chamber inner section being connected with said outlet passage through said central opening at said one end, said catalytic element being perforated over the length of said

chamber and over a portion of its circumference, the remainder of its circumference being nonperforated,

means defining a plurality of gas inlet ports extending laterally from said chamber through the side of said housing, said inlet ports connecting tangentially with said chamber outer section through inlet openings provided in said insulating liner such that gas admitted to said outer section through said ports is directed in a unidirectional swirling motion within said outer section,

nonperforated baffle means extending tangentially from the nonperforated portion of said catalytic element to said insulating liner at said liner inlet openings to force entering gas flow through an extended path to the perforated portion of said catalytic element and then radially therethrough to said chamber inner section,

primary reaction air distribution means including a longitudinal manifold passage integrally formed in said cast housing adjacent said chamber and said inlet ports, a plurality of runners extending from said manifold passage and merging with each of said inlet ports adjacent their respective liner inlet openings to direct air into the exhaust gases passing from each of said ports into said outer chamber section,

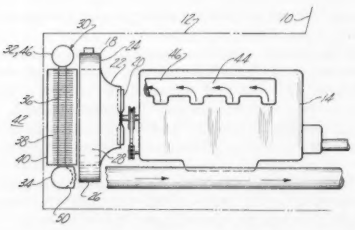
secondary reaction air distribution means in said housing and including a distribution tube extending longitudinally through said inner chamber section and generally concentric with said catalytic element, said tube being supported in said housing at one end and in said removable cap at said other end, said tube being perforated over the length of said chamber to permit fluid flow radially from said tube interior to said chamber inner section to mix and react with gas entering said inner chamber section through said catalytic element,

said tube, said catalytic element and said insulating liner being removable from said housing for inspection or replacement upon removal of said cap.

3,927,526
EXHAUST MOISTURE REDUCTION BY PROTOTYPE HEAT EXCHANGER

Jack V. Tedrow, U.S. Army Cold Regions Research and Engineering Laboratory, Alaskan Div., Fort Wainwright, AK, APO, Seattle, Wash. 98731

Filed Dec. 4, 1973, Ser. No. 421,571
Int. Cl.² F01N *3/02*
U.S. Cl. 60—320 **1 Claim**

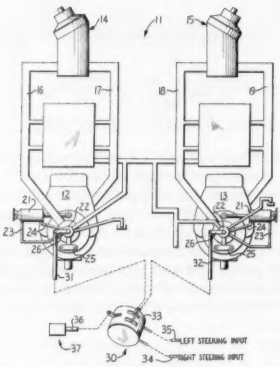


1. A land vehicle adapted for use in winter environments comprising a propulsion engine of the liquid-cooled type; means for cooling the engine including a radiator for reducing the temperature of the coolant, and a fan for drawing air through the radiator; duct means for exhausting combustion products from the engine; said exhaust duct means comprising a multi-tube heat exchanger located upstream from the radiator in near adjacency to the radiator and directly in the airstream developed by the fan, whereby both the radiator and heat exchanger are air-cooled by said fan; said heat exchanger having sufficient tube surface area so that the gases discharged to the winter atmosphere have insufficient condensibles to form a fog visible beyond sight of the vehicle; the radiator and heat exchanger occupying spaced vertical planes forward of the fan; the heat exchanger comprising an inlet header for receiving gases from the engine, an outlet header directly below the inlet header, and a number of heat transfer tubes extending vertically between the headers in the airstream developed by the fan, said heat transfer tubes being arranged in parallel flow relation to receive component gas streams from the inlet header for individual cooling by the airstream; said heat exchanger and radiator having approximately the same face area so that each face area is entirely exposed to fan action.

3,927,527
MECHANICAL MULTIPLIER-DESIGN II

William Karl Engel, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 17, 1975, Ser. No. 541,818
Int. Cl.² F16H *39/46*
U.S. Cl. 60—427 **6 Claims**



1. A mechanical multiplier mechanism comprising,

a linearly movable input member slidable along a first line and including means forming a linear slot therein normal to said first line,

a cylindrical rotatable input member including means forming a diametrical slot therein,

a linearly movable output member slidable along a second line normal to said first line, and including means forming a linear slot therein normal to said second line, and

pin assembly means disposed mutually in all of said slots.

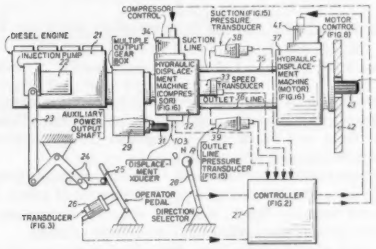
3,927,528
CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE AND VARIABLE TRANSMISSION POWER TRAIN

Hans-Jürgen van der Kolk, Sersheim; Reinhard Mindner, Gutenberg; Tilman Kiess, Stuttgart; Peter Mühlich, Esslingen; Ulrich Aldinger, Stuttgart, all of Germany, and Karl-Heinz Adler, Maisons-Laffitte, France, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhoehe, Germany

Filed Aug. 14, 1974, Ser. No. 497,361
Claims priority, application Germany, Aug. 13, 1973, 2340841
Int. Cl.² F16D *31/02;* **F02D** *11/10;* **G05G** *21/00;* **B60K** *41/18*
U.S. Cl. 60—431 **37 Claims**

1. Control system for an internal combustion engine power train to provide drive output power to a load shaft (**43**) having an internal combustion engine (**21**) and a variable ratio transmission (**32, 37**);

fuel injection pump means (**48, 22**) injecting fuel for use by the internal combustion engine;
an operator controller (**25**);
means (**46, 49**) connected to the fuel injection pump and controlled by the operator controller (**25**) to control the amount of fuel being injected;
a transmission control means (**34, 41**) connected to the transmission and controlling the transmission ratio thereof;
characterized by
a command signal transducer means (**26**) connected to and controlled by the operator controller (**25**) and providing an engine command signal;
engine torque transducer means providing a transmission input torque (M_1) signal connected to and controlled by the input to the transmission (**32, 37**);
transmission output torque transducer means providing a transmission output torque (M_2) signal connected to and controlled by the output of the transmission (**32, 37**);



tachometer generator means (**33**) providing an engine speed (n_1) signal and in rotation transmitting relation to the engine;
transmission operating sensing means (**103**) providing a transmission operation signal and sensing the transmission ratio of the transmission (**32, 37**);
and a control unit (**27**) including electrial logical circuit means, connected to and controlled by said command signal transducer means (**26**), the engine torque transducer means, the transmission output torque transducer means, the tachometer generator means (**33**) and the transmission operating sensing means (**103**), and logically combining the signals provided by all said means and providing output signals connected to and controlling the transmission control means (**34, 41**) to control the transmission ratio in accordance with the signals from all said means, as modified by characteristic transfer functions stored in said control unit, and as logically combined in said control unit.

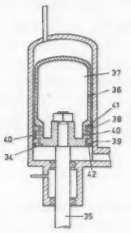
3,927,529

MULTI-CYLINDER DOUBLE-ACTING STIRLING CYCLE ENGINES

Sven Anders Samuel Hakansson, Varberg, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed July 31, 1974, Ser. No. 493,390
Claims priority, application United Kingdom, Aug. 22, 1973, 39694
Int. Cl.² F01B *29/10*
U.S. Cl. 60—521 **2 Claims**

1. A multi-cylinder double-acting Stirling cycle engine of the kind in which each cylinder contains a piston which separates a low temperature working space from a high temperature working space in the cylinder and each piston separates from each other two different charges of working gas operating in respective working cycles by means of at least two axially spaced piston rings and having working gas conveyance means connected to each said cylinder with working gas therein maintained at minimum cycle pressure, characterized in that each piston is provided with a cavity having a volume greater than the swept volume of the cylinder for receiving therein said working gas that may leak through one of said piston rings into the space between said two piston rings, at



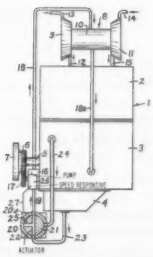
least one passage defined in said piston connecting said cavity at the outer surface of the piston to the space between said two piston rings thereby to permit entry of leakage gas into said cavity, and means permitting passage of working gas from said space between said two piston rings into said two charges for thereby maintaining said minimum cycle pressure in said cavity.

3,927,530

SUPERCHARGED INTERNAL COMBUSTION ENGINE

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed May 28, 1974, Ser. No. 473,416
Int. Cl.² F02B *33/44*
U.S. Cl. 60—607 **14 Claims**

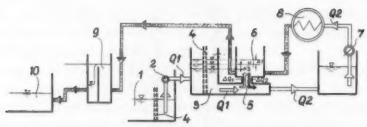


1. Hydraulic switching apparatus for a hydraulic motor driven device for delivering condition altering means to a power generator comprising a hydraulic pump that is connected to and constantly driven by said generator when said generator is operating, a first fluid flow passageway between said pump and the hydraulic motor of said device, a selector valve having an outlet connected to said pump, a reservoir with liquid therein and having a chamber above the liquid and containing gas or vapor, a second fluid flow passageway extending from said pump and arranged to receive liquid from the reservoir from a point below the level of the liquid therein, a third fluid flow passageway extending between said valve and said chamber above said liquid, valving means in said valve that in one position thereof permits liquid to flow therethrough to said pump and in another position thereof permits vapor or gas to flow to said pump so as to prevent liquid flow to the pump, and means for moving said valving means to and from said positions.

3,927,531
COOLING WATER SUPPLY SYSTEM WITH SELF ADJUSTING HYDRAULICS

Sándor Mikolics; Károly Ziegler, and Viktor Homola, all of Budapest, Hungary, assignors to Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt., Budapest, Hungary

Filed July 15, 1974, Ser. No. 488,773
Claims priority, application Hungary, July 25, 1973, MI 541
Int. Cl.² F01K 9/00
U.S. Cl. 60—690 4 Claims

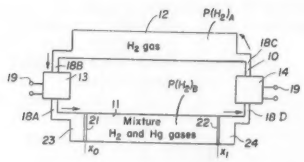


1. A method of operating a cooling supply system for the condenser of a power plant which comprises the steps of:
pumping cooling water from a source through a cooling water channel at a first location;
pumping water from said channel at a second location through said condenser and through a warm-water channel;
bypassing said channels into one another; and
controlling the flow of water from one channel into the other at the bypass solely by the relative rates pumped at said location.

3,927,532
THERMOMOLECULAR RECTIFIER

Antonio M. C. de Figueiredo, Hartford, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 26, 1974, Ser. No. 527,211
Int. Cl.² F03G 7/00
U.S. Cl. 60—721 4 Claims

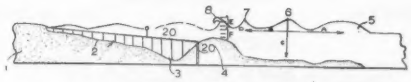


1. Apparatus for the generation of power based on the difference of partial pressures of a fluid mixture in a force field, where the fluid mixture consists of a mixture of two sets of molecules with the molecules of one set being acted upon by the force field in a discriminatory fashion to the molecules of the other field, said apparatus comprising a diffusion chamber in which the mixture of molecules is placed, with the said diffusion chamber being bounded on two opposing walls of the chamber by a membrane which is relatively permeable to the molecules of the fluid of the mixture in the diffusion chamber which is least affected by the force field and impermeable to the molecules of the fluid of the mixture in the diffusion chamber most affected by the force field, with said apparatus placed in a said force field with the opposing membrane walls of the diffusion chamber located in planes at right angles to the direction of the force field,
with two external chamber, each bounding an opposed membrane wall of the diffusion chamber, linked together by means of tubing which leads through a fluid pressure-operated power generator and to a reservoir chamber containing molecules of the fluid in the mixture that is permeable to the membrane, such that when the force field is applied to the diffusion chamber, the partial pressure of the permeable fluid is greater inside the diffusion chamber against one membrane wall then is said partial pressure against the opposing membrane wall, with the pressure of the permeable fluid in the external chambers bounding the membrane being of a magnitude between said partial pressures.

3,927,533
UNDERWATER WALL STRUCTURE

Robert Newman Hebel, Jr., 5306 Bowling Green Drive, Fort Pierce, Fla. 33450

Filed Aug. 13, 1974, Ser. No. 496,935
Int. Cl.² E02B 3/04
U.S. Cl. 61—4 7 Claims



1. For use in the process of shoreline accretion along a beach having an offshore bar, located no further than 150 feet offshore from said beach, and a longshore trough, immediately adjacent to said offshore bar;
A. a permanent underwater wall structure located between said bar and said beach at a point shoreward of where the waves normally break; said wall structure comprising a series of individual pilings in side-by-side relation,
1. each of said pilings being embedded at one end in the ocean floor, at such a depth that the top of each of the offshore pilings is below the water level at mean low tide, and is no higher than the highest point of said offshore bar;
B. said underwater wall structure comprising two end sections and a connecting middle section,
1. said end sections located in spaced apart relation, extending seawardly no more that 150 feet, from the vicinity of said beach and through said trough to said offshore bar,
2. said middle section extending along said bar, between said longshore trough and said offshore bar and connecting each of said end sections to form a contiguous, unitary, underwater wall structure;
3. said underwater wall structure serving to allow an unimpeded flow of water shoreward, but impeding the offshore and littoral currents sufficiently to allow deposition of suspended particles within the are bounded by said wall structure.

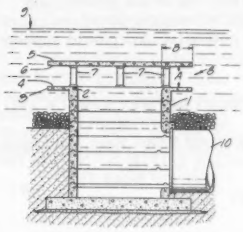
3,927,534
WATER INTAKE STRUCTURE

Lory E. Larson, Garden Grove, and Dallas I. Downs, Montrose, both of Calif., assignors to Southern California Edison Company, Rosemead, Calif.

Filed Jan. 21, 1974, Ser. No. 435,128
Int. Cl.² E02B 9/04, 5/08
U.S. Cl. 61—17 17 Claims

1. A water intake system for withdrawing water from a body of water containing fish comprising:
intake channel means communicating with said body of water, the channel means being dimensioned such that a substantially uniform horizontal velocity profile is established in the water flowing in at least the portion of the channel means adjacent the inlet thereto; and
conduit means including an intake orifice communicating with said intake channel,
said intake orifice being positioned relative to the inlet of

said intake channel means such that fish entering into said intake channel means are permitted a sufficient time



to react to the flow of the water therein and exit therefrom before being drawn through said intake orifice.

3,927,535

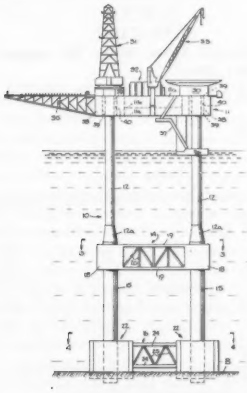
JACK-UP TYPE OFFSHORE OIL PRODUCTION PLATFORM APPARATUS AND METHOD

Robert P. Giblon, Shrewsbury, N.J., assignor to George G. Sharp, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 287,256, Sept. 8, 1972, Pat. No. 3,797,256. This application Mar. 18, 1974, Ser. No. 452,465

Int. Cl.² E02B *17/00*; **B63B** *35/44*

U.S. Cl. 61—46.5 **22 Claims**



1. Jack-up type offshore platform apparatus comprising a floatable upper platform structure, at least one horizontal lower support platform structure below and substantially aligned with said upper platform structure for disposition in vertically spaced tandem relation thereto when said apparatus is in erected condition, means defining corresponding pluralities of laterally spaced apart vertical support leg openings through each of said upper and lower support platform structures, the respective of said vertical openings through any one platform structure being vertically aligned with the respective of said openings through the other of said platform structures, a corresponding plurality of elongated lower support legs respectively extending through said vertical openings through the lowermost of said lower support platform structures and projecting downwardly therefrom, said lower support legs being rigidly attached at their upper ends to, and secured in vertically non-slidable and fixed relation to, said lowermost lower support platform structure, whereby said lowermost lower support platform structure provides lateral structural support for said support legs, and a corresponding plurality of elongated upper support legs respectively aligned with, and attached substantially to said upper ends of said lower support legs, said upper support legs respectively extending upwardly through said aligned vertical openings of any of said platform structures thereabove, and at least said upper platform structure being vertically slidable with respect to said upper support legs at least prior to the erection of said platform apparatus.

3,927,536

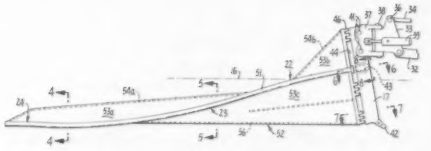
DEVICE FOR BURYING RIGID WALL PIPE

Roger L. Sprenkel, Pleasanton, Calif., assignor to American Tractor Equipment Corporation, Oakland, Calif.

Filed July 31, 1974, Ser. No. 493,233

Int. Cl.² F16L *1/00*

U.S. Cl. 61—72.4 **12 Claims**



1. A tractor supported apparatus for burying a continuous length of rigid wall pipe below the surface of the ground, comprising: an upstanding shank having a tooth at the lower end thereof and constructed to rip a pipe burial trench in the ground; pivot means mounting the shank to the tractor for side-to-side swinging movement, up and down movement, and side-to-side pivotal movement of the shank; an elongate, substantially flat, planar pipe guide member having a forward end and a trailing end, said forward end pivotally connected to the shank for trailing movement of the guide member after the shank in a trench; an elongate, generally S-shaped, open-ended pipe guiding passageway in the guide member and extending throughout the length of the guide member, said S-shaped passageway including a pipe receiving portion at the forward end of the guide member extending upwardly at an angle of about 10° relative to the horizontal to receive a length of rigid wall pipe therein at an angle to the horizontal, a first curved section curving downwardly from the pipe receiving portion for bending and depressing a length of pipe into the trench, a second curved section connected to the first curved section and having a curvature inverse to the curvature of the first section and having a trailing end portion which ascends relative to the bottom of the trench for bending the pipe and disposing it near the bottom of the trench, and a third section connected to the second section and including a straight portion extending substantially parallel to the bottom of the trench to bend and straighten the pipe and discharge the pipe into the bottom of the trench, so that the pipe will lie straight in the trench free of residual bending stresses.

3,927,537

OVERLOAD COUPLING

Norman J. Anderson, Fairview, and Jon R. Mancusco, Erie, both of Pa., assignors to Zurn Industries, Inc., Erie, Pa.

Filed Aug. 1, 1974, Ser. No. 493,556

Int. Cl.² F16D *7/00*

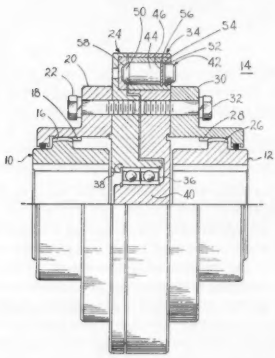
U.S. Cl. 64—28 **7 Claims**

7. An overload protection coupling for interconnecting a driving source of power with a driven load comprising, in combination:

a. A first, rotatable clutch member and a second rotatable clutch member; means for mounting said first clutch member adjacent said second clutch member on the same axis of rotation; means for connecting said first clutch member to a shaft connected to said driving source of power; and means for connecting said second clutch member to a shaft connected to said driven source of power;

b. One of said clutch members having a plurality of apertures spaced about its circumference; a coupling pin slidably mounted in each of said apertures; the other of said clutch members having a plurality of recesses about its circumference which is equal to said plurality of apertures with said recesses being so positioned that each of said recesses is engageable by a first end of one of said coupling pins;

c. Said first end of each of said coupling pins having a truncated conical shape; each of said recesses having a corresponding shape for receiving said first end of said coupling pin to connect said first clutch member to said second clutch member during the normal operation of said coupling; said coupling pins being disengagable from said recesses under overload conditions to disconnect



said first clutch member from said second clutch member;

d. Each of said coupling pins having at least one pin groove about its circumference; uniform force detent ring means of varying width; said clutch member having said plurality of apertures also includes at least one groove for each of said detent ring means; said detent ring means being of such a size that it can simultaneously engage a pin groove on at least one of said coupling pins and a groove on the last mentioned clutch member; said at least one pin groove and said groove on the last mentioned clutch member being so positioned that said detent ring engages them simultaneously when said first end of said coupling pins engages said recesses; and said detent ring means being disengagable from one of said grooves when an overload condition occurs and said first ends of said coupling pins are disengaged from said recesses; and

e. Said detent ring being mounted in said pin groove and the structure of said detent ring and shape of said one of said grooves from which said detent ring is disengageable causing the axial force F_a at which said first end of said coupling pin is disengaged from said recess to substantially comprise:

$$F_a = 5P[\text{Tan } \alpha + \text{Tan } \theta]$$

where,

$P = Efbh^3/2.36\ D_m3$ = radial force produced,

E is Youngs modulous for the material used for said detent ring,

f is an amount said detent ring must collapse to free said detent ring from said one of said grooves to cause said coupling pin to disengage from said recess,

D_m is the mean diameter of said detent ring, the dimension measured from the middle of a width h of said detent ring opposite a gap between ends of said detent ring to what would be the middle of the width at the gap if said ends of said detent ring were extended to the gap,

b is the thickness of said detent ring, uniform about the circumference in the preferred embodiment,

Tan θ is the coefficient of friction between said detent ring and said one of said grooves, and

α is the angle between the side of said one of said grooves and the portion of said groove opposite said detent ring.

3,927,538

KNITTING AND CROCHET NEEDLE AND SEWING NEEDLE COMBINATION

Amelia Martella, Camel Hollow Road, Huntington, N.Y. 11743

Filed July 5, 1974, Ser. No. 486,190

Int. Cl.² D04B *35/02*

U.S. Cl. 66—117 **4 Claims**

1. A needle assembly comprising a relatively large needle which at one end has an elongated opening along an axis of said needle, said opening forming a chamber, a removable end cap attachable on said needle end for selectively closing said chamber, said chamber containing a removable yarn sewing needle, an inner end of said end cap having an axial opening, said yarn sewing needle having an eye at one end thereof, said eye being received within said end cap opening so that said end cap carries said yarn sewing needle.

3,927,539

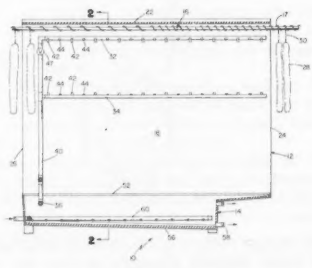
SPRAYING

Norman W. Harkison, Taylor Ridge, Ill., assignor to A-T-O Inc., Willoughby, Ohio

Filed Apr. 1, 1974, Ser. No. 456,724

Int. Cl.² D06F *35/00*

U.S. Cl. 68—3 R **19 Claims**



1. In a system for washing garments while hung on hangers and including a spray soak station comprising a spray chamber, a conveyor extending longitudinally through said station and arranged for transporting garments on hangers through said chamber with the broad sides thereof generally parallel to each other and perpendicular to said conveyor, two sets of nozzles mounted within said chamber in a first generally horizontal plane below said conveyor, one of said sets being mounted on each side of the vertical plane including said conveyor, each of said sets including a plurality of nozzles mounted along a respective line extending generally parallel to said conveyor, and each of said nozzles being arranged to direct spray fluid against said garments on hangers being transported through said chamber on said conveyor, that improvement wherein:

each of said sets includes a plurality of conical spray nozzles and a plurality of flat spray nozzles, and the nozzles of said each of said sets are arranged such that at least some

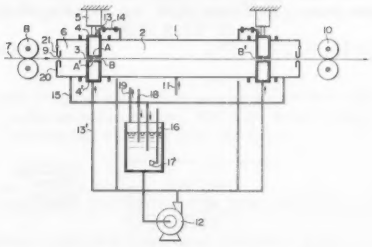
of the conical nozzles of said each set are intermediate respective pairs of flat spray nozzles of said each set.

3,927,540

APPARATUS FOR CONTINUOUSLY HEAT-TREATING FIBROUS MATERIALS UNDER PRESSURE

Kazue Tanaka; Katsuo Yamamoto; Hisao Nakamura, and Eiichi Wakita, all of Fujishi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed June 19, 1974, Ser. No. 480,859
Claims priority, application Japan, June 27, 1973, 48-71633
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E 10 Claims



1. An apparatus for continuously heat-treating fibrous materials with a pressurized fluid, which apparatus is capable of continuously passing knot parts or parts of varied thickness of fibrous materials therethrough and in which sealing parts and sealing fluid overflow chambers adjacent thereto are provided at each end of a heat-treating pressure chamber, each of said sealing parts being positioned between the heat-treating chamber and a respective overflow chamber, comprising

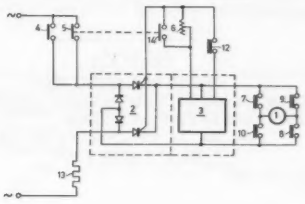
1. a chamber for treating fibrous materials with a pressurized fluid,
2. each of said sealing parts comprising a pair of sealing boxes each of said sealing boxes being provided with
   a. a nozzle for injecting a sealing fluid into said sealing box in contact with the fibrous materials to be treated which are passing through a clearance between said pair of sealing boxes, said nozzle having a linear slit opened perpendicularly to a travelling direction of the fibrous materials so as to inject the sealing fluid uniformly in a transverse direction and being inclined to the fibrous materials at an angle of 30° to 90° in a direction from a position remote from the heat-treating pressure chamber toward a position close thereto, and
   b. a sealing fluid inlet on a side opposite to said nozzle, sealing fluid being injected through said nozzle and being overflown into each of said overflow chambers while preventing the pressurized fluid from leaking out of the heat-treating chamber,
3. a means for sliding at least one of said sealing boxes in each pair to permit the clearance between the sealing boxes in contact with the fibrous material to be adjusted to correspond to a sudden change in the thickness of the travelling fibrous materials, and
4. an individual casing for housing each slidable sealing box through a small clearance between the slidable sealing box and the casing, each casing having a lateral width differing from that of the heat-treating pressure chamber to provide a non-linear channel against the passage of the pressurized fluid.

3,927,541

DEVICE FOR CONTROLLING THE SPIN-DRYING SPEED IN A WASHING MACHINE

Yves Albert Daniel Thibaut, Amiens, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 2, 1974, Ser. No. 485,224
Claims priority, application France, July 5, 1973, 73.24693
Int. Cl.[2] D06F *33/00*
U.S. Cl. 68—12 R 2 Claims



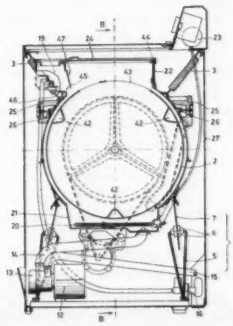
1. In a washing machine of the type comprising a tub, a drum mounted for rotation within the tub, a d.c. motor for driving the drum at least at a low washing and a high spin-drying speed, a water level control device, switching means for changing from washing speed to spin-drying speed while the tub is filled with water, means for setting a maximum spin-drying speed, a motor supply control device, and electric speed regulator means responsive to the setting means for controlling said motor supply control device, an improved spin-drying control device comprising a switch contact responsive to the level of water in the tub, and wherein said setting means comprises a variable resistor, said speed regulator being responsive to the setting of a circuit comprising said switch contact connected to said variable resistor.

3,927,542

LAUNDRY WASHING AND DRYING MACHINE

Philippe de Hedouville, Feuquieres-en-Vimeu, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 13, 1974, Ser. No. 441,972
Claims priority, application France, Feb. 19, 1973, 73.05802
Int. Cl.[2] D06F *23/02*, *39/02*
U.S. Cl. 68—17 R 1 Claim



1. A laundry machine of the top loading type comprising a housing having an opening in a top surface for loading and removing articles, lid means for covering the opening, a tub, a drum mounted in the tub for rotation about a horizontal axis, means for suspending said tub within said housing by shock absorbing devices and for positioning said tub by friction devices, means for driving the drum in different directions and

at different speeds, and means for supplying and removing water from the tub, wherein said tub comprises a loading funnel portion extending toward said opening and having an open end aligned with said opening, a door hingedly connected to the funnel at an upper end thereof for covering said open end, and means for dispensing detergent disposed adjacent a free edge of said open end, said dispensing means having a first side constituted by a wall of the funnel forming one side of a passage opening into the tub, said passage comprising a second side formed by one surface of a partition whose other surface constitutes a wall of the actual clothes-guiding portion of the funnel.

3,927,543

DESINTEGRATING KEY

Ivan Krestev Anastasov, Sofia, Bulgaria, assignor to Glavna Directzia Kbumkp Pri Sgns, Bulgaria

Filed Jan. 28, 1974, Ser. No. 437,243
Int. Cl.[2] E05B *19/00*
U.S. Cl. 70—395 **5 Claims**

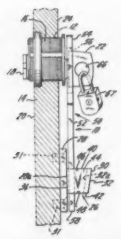
1. A disintegrating key comprising two perforated flat plates disposed in spaced parallel relationship to one another so that their respective perforations are aligned and adapted to receive a third plate inserted between said parallel plates, said third plate also being perforated with holes capable of being aligned with the perforations of the parallel plates, said perforations and holes being further adapted to engage when properly aligned the pins of a lock when inserted therein.

3,927,544

LOCK SECURING ASSEMBLY

Jack Klein, South Orange, N.J., assignor to S.S.B. Industries, Inc., South Orange, N.J.

Filed Nov. 6, 1974, Ser. No. 521,360
Int. Cl.[2] E05B *13/00*
U.S. Cl. 70—416 **10 Claims**



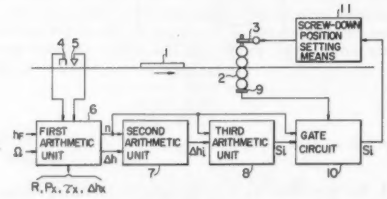
1. A lock securing assembly comprising, in combination, bar anchor means adapted to be secured to a door or in close proximity to a door in which the cylinder portion of a lock is disposed, said bar anchor means comprising a base member adapted to be secured to said door, and a guide member connected to said base member and including an inclined passageway having a relatively wide end connected to a relatively narrow end; said relatively wide end being positioned so as to be in closer proximity to said lock than said relatively narrow end; and bar means comprising an elongated bar having first and second end portions, said first end portion including a slot which is adapted to be engaged over a knob extending from said lock, and the second end portion of which is adapted to be positioned and retained in said passageway of said bar anchor means, said slot of said bar means when positioned over said knob and in said passageway of said bar anchor means preventing rotation of said cylinder and knob of said lock, said bar means being adapted to be removed from said knob and said bar anchor means by lifting said first end out from engagement with said knob while pivoting said second end in said passageway.

3,927,545

ROLLING METHOD FOR ROLLING MILLS

Yasuo Morooka, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 15, 1975, Ser. No. 568,193
Claims priority, application Japan, Apr. 17, 1974, 49-42148
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—6 **12 Claims**



1. A rolling method for rolling mills comprising the steps of: obtaining a mean rolling reduction Δh and the number n of passes for carrying out rolling in a minimum period of time from the rolling specifications and by detecting the temperature and thickness of a material to be rolled at the entrance side of the rolling mill, and

determining the rolling schedule, such that the value of rolling reduction selected for each pass in initial and terminating stages of the rolling operation is smaller than that of the mean rolling reduction and yet the total rolling reduction is equal to the product of the mean rolling reduction Δh and the number n of passes.

3,927,546

MOLD FOR CONTINUOUS CASTING OF METAL

Lorne Russell Shrum, 820 Manchester Road, London, Ontario, Canada

Filed Oct. 15, 1974, Ser. No. 515,072
Int. Cl.[2] B21D *26/08*
U.S. Cl. 72—56 **10 Claims**

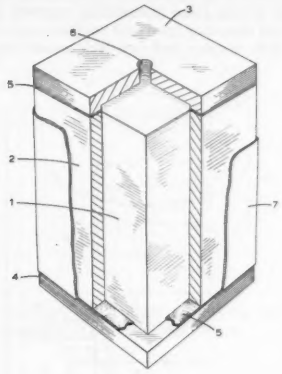
1. A method of forming a tubular copper mould for the continuous casting of metals, comprising the steps of:

forming an arbor having an external surface having the profile and finish required of the finished mould,

fitting a copper sleeve of the same general shape as the finished mould on the arbor,

surrounding the sleeve with a charge of high explosive material providing a detonation path extending longitudinally of the sleeve, fully immersing the sleeve and its

surrounding charge in a liquid,



detonating the charge so as to apply a pressure to the sleeve sufficient to cause plastic flow in the material thereof, and withdrawing the arbor from the sleeve.

3,927,547

MANDREL EXCHANGE FOR DIAGONAL ROLLING MILL

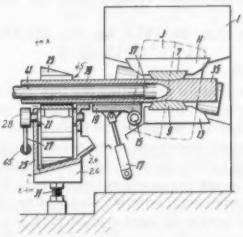
Wolfram Schonfeld, Meerbusch-Osterath; Armin Philipps, Dusseldorf; Hans Eversberg, Monchen-Gladbach; Karl-Heinz Hausler, Korschenbroich, and Robert Samans, Dusseldorf, all of Germany, assignors to Mannesmannrohren-Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 12, 1974, Ser. No. 505,270

Claims priority, application Germany, Sept. 12, 1973, 334948[U]

Int. Cl.² B21B *25/06*

U.S. Cl. 72—97 **6 Claims**



1. In a diagonal rolling unit having rolls cooperating with a mandrel removably disposed on a retractible mandrel rod and onto which the rolls roll a hollow billet, the improvement comprising:

a drum-like mandrel holder having a plurality of peripheral, axial extending compartments each having a bottom contour matching the periphery of a rolled billet, the drum disposed along the line of rolling so that one compartment of generally upward orientation is in line to receive the rolled hollow billet as emerging from the mill during rolling and in tight slidable fit on the bottom of the one compartment, and being held thereon and guided along during rolling;

means disposed between the drum and the rolls for holding a mandrel to remain outside of said one compartment without passing through when the mandrel rod and rolled billet are retracted;

means for rotating the drum when the mandrel rod with hollow billet has been completely withdrawn for placing another compartment holding a new mandrel in line with the mandrel rod and the line of rolling; and

guide means at the exit side of the mill and adjacent the drum for guiding the mandrel, which was removed from the mandrel rod out of the line of rolling in down direction and into an empty compartment of the drum, the empty compartment being open at least to some extent and having orientation in a more down direction, there being holding means for retaining the mandrel therein once having been guided into that compartment.

3,927,548

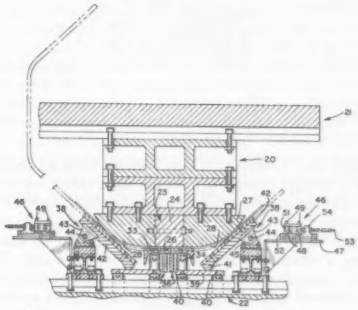
APPARATUS FOR FORMING ARCHED ROOF SHEETS FOR AUTOMOTIVE CARRIER VEHICLE

William W. Lannin, Hammond, Ind., assignor to Stanray Corporation, Chicago, Ill.

Filed Dec. 28, 1973, Ser. No. 429,377

Int. Cl.² B21D *11/20, 37/06*

U.S. Cl. 72—321 **3 Claims**



1. Apparatus for forming an arched roof sheet from a flat sheet including a plurality of spaced longitudinally extending corrugations, said apparatus comprising an upper die and a lower die movable relative to each other between an open position and a closed position, said upper die including a flat upper central section and convexly curved side sections on the opposite ends of said central section, spaced resilient strip means longitudinally extending across said flat central section and said curved side sections, said strips being fastened only to said central section, said lower die including a lower central channel, a pair of pivotally mounted planar end sections adapted to progressively and tangentially engage said convex surfaces when said upper central section depresses said lower central channel, and longitudinally extending strip means in staggered relationship to said resilient strip means on said upper central section, and detachably underlying said curved side sections.

3,927,549

EJECTING DEVICE FOR USE IN METAL FORGING MACHINE

Norbert Dycke, Baden-Wurttemberg, Germany, and Hiroshi Sakai, Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Japan

Filed Oct. 24, 1974, Ser. No. 517,745

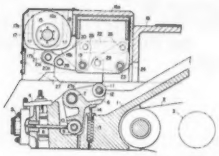
Claims priority, application Japan, Oct. 24, 1973, 48-118895

Int. Cl.² B21D *45/00*

U.S. Cl. 72—345 **1 Claim**

1. An ejecting device for use in a metal forging machine including therein an ejector pin slidably inserted into the distal end of a slide of the machine, said slide being reciprocated in response to rotation of a crank shaft provided within the

machine, and a L-shaped rocking arm having upper and lower guide rollers at each end thereof and rockably mounted on the slide through a pivotal shaft so as to exert an ejecting motion on said ejector pin, which comprises a pair of rotary cams rotatably mounted on a cam shaft, which is rotatably supported by a frame of the device and is rotated by receiving rotation of said crank shaft, a pair of first and second triangular rocking members, each being rockably supported by said frame through a pivotal shaft at each first apex portion thereof, which are connected with each other through a link at their respective second apex portions and are arranged in such a manner that the respective four pivotal shafts for supporting said rocking members and said link are positioned at respective four corners of a parallelogram, a guide roller



rotatably mounted on said first rocking member through an integral bracket extending from the third apex portion of said first rocking member so that said guide roller is guided by the respective outer peripheries of said pair of rotary cams when said pair of rotary cams are rotated, and an up and down moving element movably suspended between said first and second triangular rocking members at their respective third apex portions and coming into contact with the rocking arm at the underside flat surface thereof through said upper guide roller of said rocking arm, wherein the rocking motion of said rocking arm exerting the ejecting motion on said ejector pin is caused by the action of said pair of rotary cams, thereby causing ejecting motion of said ejector pin regardless of the reciprocation of said slide.

3,927,550

DEVICE FOR STRAIGHTENING DEFORMED VEHICLES OR VEHICLE PARTS

Mokjas Erik Samuel Samuelsson, Rattvik, Sweden, assignor to Finmekano Erik Samuelsson AB, Rattvik, Sweden

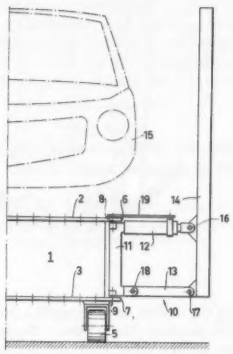
Filed Nov. 30, 1973, Ser. No. 420,384

Claims priority, application Sweden, Dec. 13, 1972, 16266/72

Int. Cl.² B21D *1/12, 37/06*

U.S. Cl. 72—447 **4 Claims**

1. Apparatus for straightening a vehicle component comprising, a platform for supporting a vehicle component, said platform having a side edge, a vertically extending support arm having opposite ends connected to said platform adjacent said side edge for pivotal movement of said support arm about a generally vertical arm axis, a vertically extending force transmitting member spaced outwardly from said support arm and having upper and lower ends, a link member extending between said support arm and the lower end of said force transmitting member and having opposite ends pivotally interconnected with said support arm and force transmitting member at horizontal axes generally parallel to one another, extendable and retractable jack means between said support arm and said lower end of said force transmitting member and generally parallel to and vertically spaced from said link member, said jack means having one end rigidly connected with said support arm and the other end pivotally interconnected with said force transmitting member at a horizontal axis parallel to said axes at said link member ends, whereby extension and retraction of said jack means pivotally displaces said upper end of said force transmitting member in a vertical plane toward and away from said platform edge, said support arm, said link member and said jack means supporting said



force transmitting member for pivotal movement along an arcuate path about said vertical arm axis and relative to said platform edge, thus to vary the angle of said vertical plane with respect to said platform edge, and means on said force transmitting member for connection with said vehicle component.

3,927,551

FRACTURED GLASS TESTING PANEL FOR DYED LIQUID PENETRANTS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Filed Mar. 20, 1974, Ser. No. 452,757

Int. Cl.² G01N *19/08*

U.S. Cl. 73—1 R **4 Claims**

1. In a test method for evaluating the flaw detection performance capabilities of dyed liquid inspection penetrants in which a test penetrant is applied to the surface of a cracked testing panel, excess penetrant is removed by application of a remover, and the testing panel is examined for the presence of entrapments of penetrant in any surface cracks which may be present, the improvement wherein said testing panel consists of a glass panel having at least one surface grit-blasted to a roughness corresponding to a grit mesh in the range of from about 10 mesh up to about 250 mesh.

3,927,552

UNDERWATER STRAIN SENSOR

Joel A. Sinsky, Randallstown, Md., and Dorsey J. G. Gregan, Arlington, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 20, 1974, Ser. No. 525,707

Int. Cl.² H04R *29/00*

U.S. Cl. 73—1 DV **2 Claims**

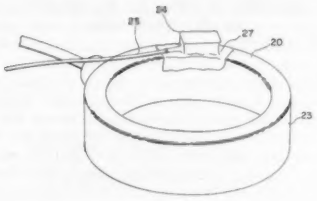
1. A method of monitoring output parameters of a magnetostrictive type ring transducer which comprises:

securing a piezoceramic strain sensor element onto said ring transducer on an edge surface centered about the mean radius with its long dimension approximately tangent to the circle of said ring;

enclosing said strain sensor element within a waterproof

housing; and

electrically connecting said strain sensor element to a



charge amplifier and voltage measuring device which indicates activity of said ring transducer.

3,927,553

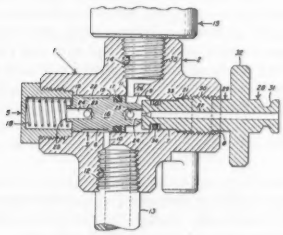
TESTING FITTING FOR PRESSURE-RESPONSIVE DEVICES

Lanier Frantz, 972 Stonegate Drive, Salem, Va. 24153

Filed Oct. 18, 1973, Ser. No. 407,488

Int. Cl.² G01L *27/00*; F16K *11/20*

U.S. Cl. 73—4 R **4 Claims**



1. A testing fitting for a pressure-responsive device, comprising a body having an aperture and a testing port in an outer end of said aperture, plug means and testing means alternately insertable in said testing port for respectively closing said port and admitting testing pressure therethrough, a pressure chamber in said aperture inwardly of and connectable through an outer end to said testing port, inlet and outlet ports opening at axially spaced positions onto said pressure chamber respectively remote from and adjacent said outer end thereof and connecting respectively to a pressure line and said pressure-responsive device, valve means in and shiftable longitudinally of said chamber between outer and inner positions for alternately connecting said outlet port respectively to said inlet and testing ports, yieldable means acting on and normally holding said valve means in said outer position, said testing means on insertion in said testing port acting directly on said valve means to exert a force in opposition to the force of said yieldable means and independently of said testing pressure for shifting said valve means to said inner position to admit said testing pressure to said pressure-responsive device, said valve means on removal of said testing means shifting to said outer position under force of said yieldable means, and said plug means being insertable in said testing port without disturbing said valve means from said outer position.

3,927,554

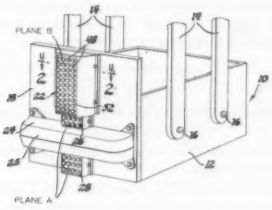
BUMPER TEST DEVICE

Fred E. Langhorst, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 1, 1974, Ser. No. 484,651

Int. Cl.² G01M *17/00*

U.S. Cl. 73—11 **3 Claims**



1. A device for testing a resilient impact receiving portion of a motor vehicle under simulated impact conditions comprising: a rigid impact bar for contacting a first area of the resilient portion of the motor vehicle to impart an impact force thereagainst, means for contacting a second area of the resilient portion of the motor vehicle adjacent the first area and including a plurality of force transmitting elements movable relative the rigid impact bar upon being contacted by the second area of the motor vehicle, and means including a plurality of discrete frangible elements supporting the plurality of force transmitting elements against movement and being individually broken when a predetermined impact force is applied thereagainst by the force transmitting means to thereby record the occurrence of such predetermined impact force.

3,927,555

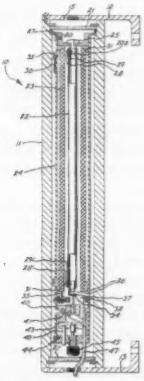
HYDROGEN DETECTOR SYSTEM

Stanley J. Godwin, Newtonville, and Robert V. Klint, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,163

Int. Cl. G01n *31/06*

U.S. Cl. 73—23 **11 Claims**



1. An improved hydrogen sensor unit comprising

a palladium alloy tubular sensing element open at both ends which exhibits a reversible change in volume dependent upon the partial pressure of hydrogen in an ambient atmosphere being analyzed and which has a thickness selected to obtain a desired speed of response,

supporting means for mounting said tubular sensing element for substantially unconstrained volumetric change in all directions over its entire length,

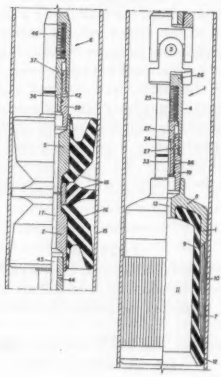
a housing and heater assembly surrounding said tubular sensing element and supporting means and forming a chamber and passageways so that both the inner and outer surfaces of said tubular sensing element are contacted by the ambient atmosphere, and

indication means responsive to the change in length of said tubular sensing element for indicating the presence of known concentrations of hydrogen.

3,927,556
EXPANDABLE PIPELINE PLUG LEAK LOCATION METHOD

Walter E. Hyde, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 240,071, March 31, 1972. This application Nov. 15, 1973, Ser. No. 415,947
Int. Cl.² G01M *3/28*; F16L *55/12*
U.S. Cl. 73—40.5 R **16 Claims**



1. A method of locating a leak in a pipeline, comprising:

a. placing an unexpanded separation plug in a section of pipeline to be tested;

b. pumping fluid into one end of said section so as to pressurize a first portion of said section;

c. moving said unexpanded plug toward the other end of said section in response to the pressure of said fluid pumped into said one end of said section;

d. stopping said unexpanded plug at a desired location within said section;

e. filling a second portion of said section between the unexpanded plug and the other end of said section with fluid;

f. applying at least a predetermined fluid pressure to the entire section of said pipeline;

g. expanding said separation plug in response to the existence of said predetermined fluid pressure so as to isolate said first portion from said second portion and fix the location of said plug within said section;

h. measuring one of constant pressure or pressure decrease in each of said first and second portions to determine if either portion contains a leak;

i. contracting said expanded plug;

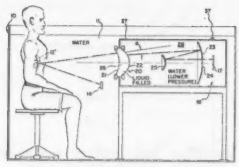
j. moving said contracted plug into one of said portions in response to measurement of pressure decrease therein; and

k. repreating steps (d) through (j) until the leak location is narrowed down sufficiently for repair.

3,927,557
ACOUSTIC IMAGING APPARATUS WITH LIQUID-FILLED ACOUSTIC CORRECTOR LENS

John R. M. Viertl, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 30, 1974, Ser. No. 474,613
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.5 R **6 Claims**



1. An acoustic imaging apparatus comprising

a transmitting transducer immersed in a first liquid for generating a train of incident acoustic pulses that are directed toward an object to be examined,

an acoustic focusing system immersed in said first liquid for focusing on an image plane the acoustic energy emanating from a planar region of the object,

said acoustic focusing system being comprised by a meniscus corrector lens filled with a second liquid at a selected adjustable pressure and having flexible membrane front and back surfaces that respectively assume a curvature dependent on the pressure difference thereacross, one of said flexible membrane surfaces being enclosed exteriorly by a pressure-tight container filled with said first liquid at a different pressure than the pressure of said first liquid engaging the other flexible membrane surface, said acoustic focusing system further including other reflector system components mounted within said pressure-tight container for forming a magnified image at said image plane,

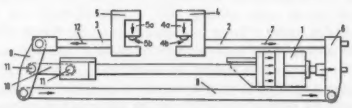
an acoustic image converter also mounted within said pressure-tight container immersed in said first liquid for converting the acoustic energy focused periodically at said image plane into electrical output data, and

means for controlling said transmitting transducer and acoustic image converter to periodically generate said electrical output data from which visual images can be obtained.

3,927,558
DETERMINATION OF PROPERTIES OF METALS

Leon Jean Philippe; Rene Charles Defraye, and Lucien Paul Renard, all of Liege, Belgium, assignors to Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed Oct. 11, 1973, Ser. No. 405,435
Claims priority, application Belgium, Oct. 11, 1972, 789963
Int. Cl.² G01N *3/08*, *3/28*
U.S. Cl. 73—95 **19 Claims**



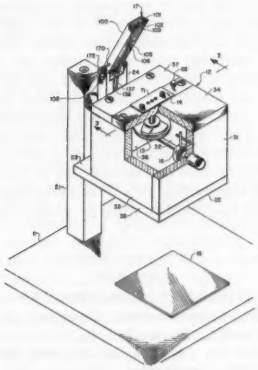
1. A process for determining mechanical properties of a metal in the form of a flat tensile test specimen, using a tensile testing machine of the horizontal type, having detectors for

measuring the load and variations in length and width of a flat measurement base of the specimen, in combination with a computer for processing of the measurement data, the process comprising the steps of: applying an identical tensile stress simultaneously from both ends of the specimen by means of two clamps engaged at opposite ends of the specimen and displacing them simultaneously at the same speed in opposite directions; and simultaneously measuring both the change in length and the change in width of the measurement base simultaneously by means of two extensometric systems which are movable independently of each other, locating and maintaining the center of symmetry of these two systems so that they are the same and are continuously coincident, until the end of the test, with the center of symmetry of the specimen and on which the specimen is centered upon placing these two systems in contact with the specimen, whereby the tensile test sequence is performed by the tensile testing machine without direct intervention of an operator, except for placing the specimen in the clamps at the beginning of the test and for withdrawing the specimen after fracture.

3,927,559
TORQUE MEASURING MEANS FOR MINIATURE WATCH MOTORS OR THE LIKE

Harry Da Costa, and Victor W. Foster, both of Scottsdale, Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Nov. 13, 1974, Ser. No. 523,287
Int. Cl.² G01L *3/18*
U.S. Cl. 73—134 **17 Claims**

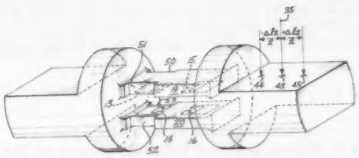


1. An apparatus for measuring the torque of a miniature motor or the like, the motor having an axle, which comprises:
a base plate;
a first pedestal member attached to said base plate;
a transparent box-like structure pivotally mounted to said first pedestal;
means for measuring and visually indicating the torque of said miniature motor, said torque indicating means being disposed within said box-like structure;
means engaging said torque indicating means for operatively coupling said miniature motor to said torque indicating means such that substantially no radial and axial load forces are applied to said miniature motor, said coupling means being attached to and disposed within said box-like structure, said coupling means being attached to said torque indicating means; and
means for electrically connecting said miniature motor to an external power source.

3,927,560
MOMENT DESENSITIZATION OF LOAD CELLS

Emory W. Farr, West Covina, Calif., assignor to Transducers, Inc., Whittier, Calif.

Filed Dec. 20, 1973, Ser. No. 426,895
Int. Cl.² G01L *1/22*
U.S. Cl. 73—141 A **13 Claims**

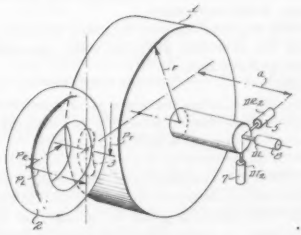


10. A process of moment desensitization of a parallelogram beam-type load cell, which load cell includes a pair of spaced, substantially parallel beams, the adjacent ends of which terminate in common planes, with first means capable of accepting a mechanical mount for supporting a load rigidly connecting a first pair of adjacent beam ends, and second means capable of being connected to a fixed support structure rigidly connecting the opposing pair of adjacent beam ends, the process including the steps of:
positioning at least two strain gauges on strain sensitive portions of each of said beams;
connecting said strain gauges from both beams in a bridge, wherein said bridge, when energized, produces an electrical output signal response which is representative of a load force applied on the mechanical mount;
determining the response of the bridge and any changes therein in response to movement of the load on said mechanical mount; and
removing a portion of each of said pair of beams in the vicinity of one and not the other of said strain gauges on each of said pair of beams, said removed portions having a position and volume dependent on the polarity of and quantity of change in the response of the bridge resulting from a known change in the position of said load on said mechanical mount.

3,927,561
METHOD AND APPARATUS FOR DETERMINING TIRE QUALITY

Peter Schleimann, Steinenbruck, Germany, assignor to Gebr. Hofmann KG, Darmstadt, Germany

Filed May 9, 1974, Ser. No. 468,581
Claims priority, application Germany, May 22, 1973, 2326046
Int. Cl.² G01M *17/02*
U.S. Cl. 73—146 **11 Claims**



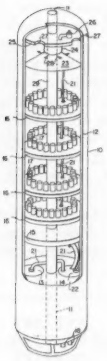
5. Device for producing an indication of tire quality comprising:

a test drum having a roll-off surface for rotatably engaging the tire to be tested,
a plurality of force pick-ups to measure the magnitude of the forces originating from the rotating tire,
two pick-ups each mounted for measuring the tangential and radial forces and at least one pick-up mounted for the lateral forces, and
an analysing circuit connected to send pick-ups for producing an output indicating the quality including means for producing an indication of the total lateral moment and means for producing an indication of radial moment.

3,927,562
ENVIRONMENTAL PROFILER

George F. Hickey, Jr., Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1974, Ser. No. 520,818
Int. Cl.[2] G01W *1/00*
U.S. Cl. 73—170 A 5 Claims

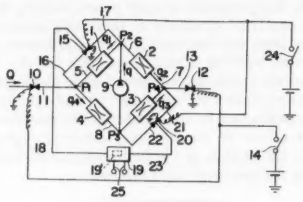


1. A self descending and ascending water parameter detection device; which comprises,
a normally negative buoyant assembly including instrumentation for detecting different water parameters during ascent and descent;
a housing,
said housing including therein a gas accumulator,
a plurality of gas generators within said housing for individually generating gas within said housing,
means for programming sequential activation of said gas generators for separately generating a gas which accumulates in said accumulator for raising said detection device, means for releasing gases from said gas accumulator subsequent to being raised to permit descent of said detection device,
whereby said detector device is raised each time a gas generator is activated and subsequently lowered each time by releasing gases from said gas accumulator.

3,927,563
FLOW RATE MEASURING SYSTEM WITH CALIBRATION MEANS

Toshiaki Konomi, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 29, 1974, Ser. No. 474,188
Claims priority, application Japan, June 6, 1973, 48-62880
Int. Cl.[2] G01F *1/00*
U.S. Cl. 73—205 D 4 Claims

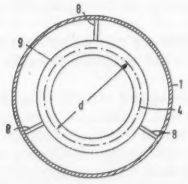


1. A method for calibrating a fluid flow rate measuring system which includes a bridge circuit having four interconnected flow orifices and four flow points each located between a different pair of said four orifices, said four flow points consisting of a first and a second pair of diagonally opposed flow points, fluid flow passage means through which fluid flow whose rate is to be measured is passed, means connecting said first pair of flow points within said passage means as inlet and outlet, respectively, to said bridge circuit, constant capacity pump means connected in flow communication across said second pair of flow points, a pressure converter adapted to generate a signal representative of fluid flow rates in response to fluid pressure applied thereacross, means for calibrating said pressure converter, first valve means for opening and closing fluid flow to and from said first pair of flow points, respectively, and means for connecting said pressure converter across said second pair of points, said method comprising the steps of operating said calibration means to calibrate said pressure converter while maintaining said pressure converter connected across said second pair of flow points and simultaneously closing fluid flow to and from said first pair of flow points with said constant capacity pump means in operation.

3,927,564
VORTEX TYPE FLOWMETER

Broder Ketelsen, Settmarshausen, Germany, assignor to Fischer & Porter Co., Warminster, Pa.

Filed Jan. 24, 1974, Ser. No. 436,368
Claims priority, application Germany, Feb. 7, 1973, 2305813
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 B 2 Claims



1. A flowmeter of the type operating on the principle of Karman's vortex streets, comprising a flow conduit through which gaseous or liquid fluids to be measured are conducted with an axially symmetrical velocity distribution; an obstacle assembly fixedly disposed in said conduit around which the fluid circulates to shed vortex streets, and a sensor to detect

the shedding vortices, said vortex shedding obstacle assembly being positioned in said conduit and shaped to initiate vortex shedding in those points only where the local flow velocity is equal to the mean velocity of the flowing fluid.

3,927,565
APPARATUS AND METHOD FOR MEASURING THE MASS FLOW OF A FLUID STREAM

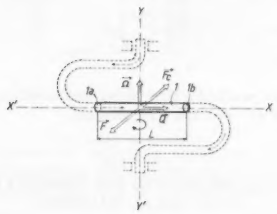
Cyrille Francois Pavlin, Septeuil; Gerard Mantoux, Bois D'Arcy; Adrien Giraud, Neuilly-sur-Seine, and Michele Grossin, Rueil-Malmaison, all of France, assignors to Bertin & Cie, Plaisir and Compagnie Francaise des Petroles, Paris, both of, France

Filed Jan. 29, 1974, Ser. No. 437,742

Claims priority, application France, Jan. 30, 1973, 73.03196

Int. Cl.[2] G01F *1/84*

U.S. Cl. 73—194 M **23 Claims**



1. In an apparatus for measuring the mass-flow of a stream of single-phase or polyphase fluid, comprising:

a stator;

a rotor mounted for rotation relatively to said stator about

a rotational axis, said rotor including:

a support structure;

a substantially rectilinear monochanneled pipe segment presenting a longitudinal axis substantially perpendicular to said rotational axis, said pipe segment having two open ends and being traversed in operation by said fluid stream, from one end thereof to the other;

means for suspending said rectilinear pipe segment on said support structure substantially symmetrically about said rotational axis and with a degree of freedom such that said rectilinear pipe segment can perform as a whole a translational movement relatively to said support structure in a direction perpendicular to both the longitudinal axis of said rectilinear pipe segment and said rotational axis;

means for reciprocatingly rotating said rotor relatively to said stator about said rotational axis; and

means for measuring in operation the force which said fluid stream applies to said rectilinear pipe segment as a result of Coriolis effect in said direction in which said pipe segment has translational freedom relatively to said support structure;

in combination, the improvement comprising an inlet system for admitting said fluid stream into and an outlet system for discharging said fluid stream out of said rectilinear pipe segment, said inlet and outlet systems each comprising:

a two-ended rotor tube rigidly fixed to said support structure and comprising a 180° bend, said rotor tube having a first open end in register with an open end of said rectilinear pipe segment, and a second open end;

a stationary stator duct having an open end; and

coupling means sealingly interconnecting said second open end of the rotor tube with said open end of the stator duct and simultaneously articulating said rotor tube with said stator duct for rotation about said rotational axis;

whereby allowing said rotor to perform a reciprocating rotation such that the total linear displacement of each end of said rectilinear pipe segment is at least equal to the diameter of said pipe segment.

3,927,566
FLOWMETERS

Klaus Joachim Zanker, Luton, England, assignor to Kent Instruments Limited, Luton, England

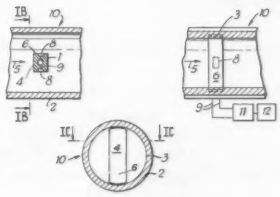
Continuation of Ser. No. 263,173, June 15, 1972, abandoned.

This application July 12, 1974, Ser. No. 488,234

Claims priority, application United Kingdom, June 17, 1971, 28510/71

Int. Cl.[2] G01F *1/00*; G01P *5/10*

U.S. Cl. 73—194 VS **11 Claims**



1. A flowmeter comprising a conduit for receiving a flow of fluid, an elongated bluff body of rectangular cross section, means for mounting the bluff body so that the body extends across the conduit and causes vortices to be generated in fluid flowing along the conduit past the body, and sensing means responsive to the formation of the vortices and adapted to generate an electrical signal representative of the rate of generation of the vortices, and hence of the rate of flow of fluid, said sensing means comprising a pair of sensors mounted on the body on opposite sides thereof downstream of a side of the body which faces the flow of fluid.

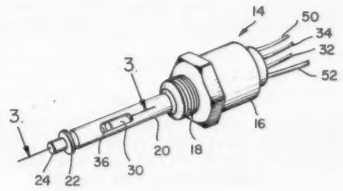
3,927,567
FLUID FLOW SENSING METHOD AND APPARATUS

Edward A. Novak, Downsview, and George F. Paclik, Mississauga, both of Canada, assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Aug. 16, 1974, Ser. No. 498,287

Int. Cl.[2] G01F *1/00*

U.S. Cl. 73—204 **2 Claims**



1. A fluid flow sensor comprising:

a generally tubular body exposed to a flow of fluid to be sensed;

a heated sensing element disposed at one end of said generally tubular body and extending into the flow of fluid;

an unheated sensing element disposed within said generally tubular body intermediate the ends thereof, said generally tubular body including at least one opening intermediate the ends thereof to permit the flow of fluid around said unheated sensing element; and

baffle means disposed on said generally tubular body intermediate said at least one opening and said heated sensing element to substantially isolate said heated sensing element from fluid flow disturbances and turbulence resul-

tant from the flow of fluid through said at least one opening in said generally tubular body.

3,927,568

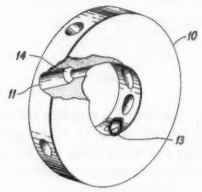
MEANS FOR IMPROVING LINEARITY OF BEARINGLESS FLOWMETER HAVING RING-SHAPED ROTOR OPERATING IN COMBINATION WITH A VORTEX CHAMBER BY CONTROLLING TURBULENCE PRODUCED BY JET PATHWAYS

David E. Hoppe, 294 Beacon St., Boston, Mass. 02116

Filed Nov. 20, 1973, Ser. No. 417,508

Int. Cl.² G01F *1/06*

U.S. Cl. 73—229 **8 Claims**



1. In a bearingless flowmeter having a chamber with a rotor positioned therein and having a plurality of jets located around the periphery of said chamber and each jet being adapted to direct fluid into said chamber and each jet being angularly oriented to produce a fluid vortex having an axial component of flow through said chamber and around said rotor, the improvement comprising

means to increase the turbulence of said fluid flowing through at least some of said jets into said chamber and with said means being applied to said at least some of said jets in a balanced disposition about the periphery of said chamber so that in the operation of said rotor in response to said fluid passing through said chamber improved linearity of flowmeter operation is thereby obtained.

3,927,569

METHOD OF SUPERVISING THE FILLING LEVEL IN HOPPERS, SHAFTS, SILOS AND THE LIKE FOR MISCELLANEOUS MATERIALS AND MEANS FOR PERFORMING THE METHOD

Sven-Gunnar Bergdahl, Jarfalla, and Erik Torsten Wangdahl, Ammeberg, both of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

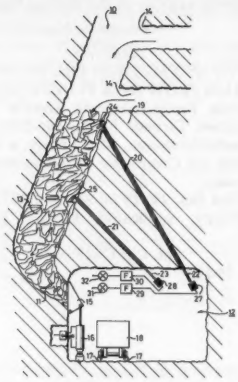
Filed Mar. 21, 1974, Ser. No. 453,389

Claims priority, application Sweden, Mar. 21, 1973, 7303961

Int. Cl.² G01F *23/00*

U.S. Cl. 73—290 V **13 Claims**

1. Method of supervising the filling level and downward movement of granular material in a vertically elongated space, which comprises pouring said material into said space past and in engagement with at least one sensing mechanism placed at a level substantially above the bottom of said space located in the downward path of said material, transforming the movement of the material engaging said sensing mechanism when falling down into said space into vibrations, converting said vibrations into indication signals denoting the falling of material past said sensing mechanism, whereby, when material in



the space has reached a level above said sensing mechanism, substantially no vibration is transmitted.

3,927,570

MEANS FOR MEASURING THE TEMPERATURE IN ELECTRICAL MACHINES

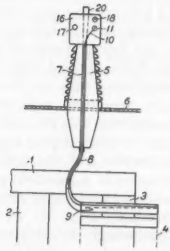
Per Hedvall, Vasteras; Wolfgang Lampe, and Erich Spicar, both of Ludvika, all of Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 8, 1974, Ser. No. 440,871

Claims priority, application Sweden, Mar. 1, 1973, 7302868

Int. Cl.² G01K *1/14, 7/08*

U.S. Cl. 73—350 **2 Claims**



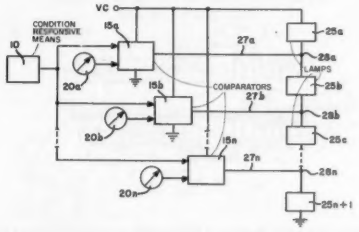
1. In an electric machine having a casing (**6**), a winding (**4**) inside the casing, and an outer terminal (**20**) outside the casing, means for measuring the temperature of said winding comprising a thermocouple having a hot junction (**9**), a cold junction and two thermocouple conductors (**10**) connecting said two junctions, at least one bushing (**5**) arranged on said casing, supporting said outer terminal, a connection lead (**8**) passing through said bushing and connecting the winding and the outer terminal, said hot junction being the measuring point of the thermocouple and being positioned on the winding conductor at a point where the temperature is to be measured, said cold junction being located adjacent the top of the bushing, said thermocouple conductors (**10**) following said winding conductor and connection lead (**8**) through the bushing to the cold junction, a temperature measuring instrument (**11**) connected to the thermocouple and positioned on the top of the bushing to said cold junction, said thermocouple having two thermocouple conductors, one of said conductors being constituted by said connection lead (**8**), the second of said

thermocouple conductors (10) being soldered to the winding conductor at the hot junction (9).

3,927,571
TEMPERATURE INDICATING DEVICE

Stuart E. Athey, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Jan. 18, 1974, Ser. No. 434,557
Int. Cl.² G01K 7/00; G01R 13/02
U.S. Cl. 73—362 8 Claims



1. A temperature indicating apparatus for indicating whether a temperature under observation is under, over, or within a predetermined range of temperatures, said apparatus including

a single temperature responsive means providing an electrical output which varies in response to the temperature sensed thereby,

first and second comparator circuits, each having an input connected to the output of said temperature responsive means, and an input connected respectively to a first and a second adjustable electrical reference source representing first and second reference temperature levels,

each of said comparator circuits providing an output which is either a source of current or ground depending upon the magnitude of the input from said temperature responsive means relative to its respective reference source,

first, second and third indicator elements connected in series between a source of current and ground,

the outputs from said first and second comparator circuits being connected to the junction between said first and second and said second and third indicator lamps, respectively,

whereby only said first element is illuminated when the temperature being observed is below the first reference level,

only said second lamp is illuminated when the temperature being observed is in the range between the first and second reference levels, and

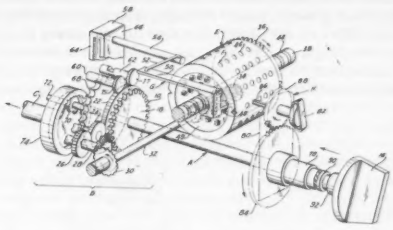
only said third element is illuminated when the temperature being observed exceeds the second reference level.

3,927,572
UHF TUNER DRIVE ASSEMBLY WITH MEMORY FINE TUNING

Carroll R. Miner, Wilbraham, Mass., assignor to General Instrument Corporation, Clifton, N.J.

Filed Nov. 23, 1973, Ser. No. 418,168
Int. Cl. F16h 35/18
U.S. Cl. 74—10.80 16 Claims

1. A tuner drive assembly for use with a tuner mechanism having a control shaft comprising a tuner shaft, a rotationally and axially movable hollow cylinder operably connected to said tuning shaft to be driven thereby, a plurality of adjustable position elements helically arranged on said cylinder so as to extend inwardly into the hollow of said cylinder, means extending into said cylinder for sequentially sensing the radial position of each of said elements as said cylinder is moved, said sensing means being operably connected to said control

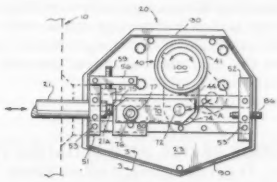


shaft to move the latter in accordance with the radial position of the element being sensed.

3,927,573
ARTICULATED ACTUATOR

John M. Sheesley, Houston, and Ronald A. Gulick, Sugarland, both of Tex., assignors to Research Engineering Co., Houston, Tex.

Filed June 24, 1974, Ser. No. 482,377
Int. Cl.² F16H 21/18
U.S. Cl. 74—50 5 Claims



1. In an actuator having a housing, a rotatable yoke member, mounted for rotation in said housing, a reciprocatable piston rod member mounted for reciprocation on said housing, and means for connecting said reciprocatable member to said rotatable member, the improvement comprising:

said housing including upper and lower pairs of track members;

said connecting means includes; traveling block member fixed to said piston rod member, at least one link pivotally connected to said traveling block member and to said rotatable yoke member, said pivotal connection to said traveling block includes a pin passing through said traveling block and said link, said pin including at each end thereof a low friction member, said low friction members each being of such size and shape as to be adapted to slide between and be guided by said pairs of track members on said housing.

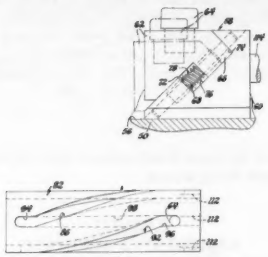
3,927,574
INDEXING MECHANISM

Daniel L. Rice, Lapeer, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 13, 1974, Ser. No. 469,091
Int. Cl.² F16H 25/12
U.S. Cl. 74—57 3 Claims

1. A mechanism for converting reciprocal movement into rotary movement comprising, a driver member supported for movement along a straight line between a first position and a second position, a driven member in the form of a sleeve encircling the driver member and having a series of circumferentially spaced helical grooves formed in the inner surface thereof, each helical groove having a tapered surface adjacent one end thereof and located along a line that is parallel to said

straight line and that connects one end of one helical groove to the other end of the adjacent helical groove, said driver member including a cam member normally located in one of said helical grooves, means including a spring supporting said cam member on said driver member for movement along an axis extending transversely to said straight line, a linear actuator connected to the driver member for moving the latter along said straight line from the first position to the second



position so as to cause the cam member to move within a helical groove and rotate the driver member a predetermined distance, and a lock member responsive to the movement of the driver member for temporarily locking the driven member in position so as to allow said cam member to be depressed by said surface along said axis extending transversely to said straight line and return along said straight line to said first position wherein the cam member enters the next helical groove.

3,927,575

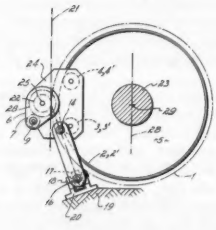
GEAR REDUCTION DEVICE WITH FLOATING PINION

Francois Durand, 11 rue du Bateau, Antibes, France

Filed Jan. 2, 1974, Ser. No. 429,760

Int. Cl.² F16H *57/00, 35/00*

U.S. Cl. 74—410 **4 Claims**



1. Carriage support structure for a gear reduction device having a floating pinion adapted to mate with a main gear, said pinion being mounted in a carriage adapted to roll along the periphery of the main gear, said carriage support structure including

at least one roller connected to said carriage, said roller being adapted to roll along an inside guide defined by said main gear to hold said pinion to mesh with said main gear, a coupler bar located exteriorly of each side of the main gear, each of said coupler bars being connected with said carriage at one end, and

a universal type joint fixed to ground, the other end of each of said coupler bars being connected with said universal type joint, said universal joint being positioned between a first line tangent to said main gear at that point where said pinion mates with said main gear and a second line parallel to said first line that passes through the center axis of said main gear, thereby reducing the forces exerted on said carriage's roller during driving engagement of said pinion with said main gear.

3,927,576

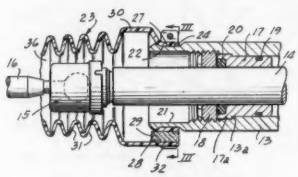
BOOT SEAL FILTER VENT

John Benjamin Colletti, Grosse Pointe Park, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 1, 1974, Ser. No. 493,554

Int. Cl.² B62D *3/12;* **F16J** *15/52*

U.S. Cl. 74—498 **7 Claims**



4. A steering gear having a tube with a bar projecting from opposite ends thereof, ball joint housings on the ends of said bar, ball studs extending from said housings in tiltable relationship, elastomeric boots having large diameter ends sealed on the ends of the tube and small diameter ends sealed on the ball studs, said boots providing expansible and contractible sealed chambers at the ends of the tube, said tube having nipples on the ends thereof defining elongated passageways venting the sealed boot chambers with the atmosphere, and elongated porous metal filter plugs tightly fitted in said passageways having exposed first end portions communicating with the sealed boot chambers and exposed second end portions communicating with the atmosphere together with elongated intermediate portions between said end portions effective to trap lubricants as air is expelled from the sealed boot chambers during contraction of the boots and for trapping contaminants from the atmosphere as air flows into the sealed boot chambers during expansion of the boots with the trapped lubricants being purged from the plugs during inflow of air into the sealed boot chambers and with contaminants being purged from the plugs upon outflow of air from the sealed boot chambers.

3,927,577

REGULATOR APPARATUS

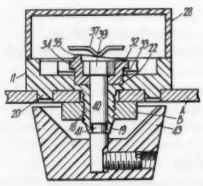
Robert Speedie, Carnegie, Australia, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 17, 1974, Ser. No. 470,878

Claims priority, application Australia, May 23, 1973, 3418/73

Int. Cl. F16h *53/00*

U.S. Cl. 74—567 **13 Claims**



1. In a regulator apparatus having a base block, a bush member formed integrally with the base block as an extension from the underside thereof and having an external screw thread engageable by a nut to secure the base block in its

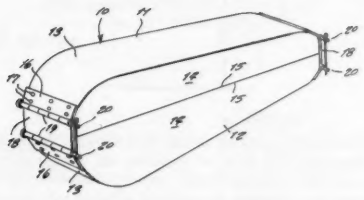
operating position, a cam means and a spindle, the cam means being mounted on the spindle and the spindle being mounted in the base block and further being rotatable about its central longitudinal axis; the improvement wherein the cam means is mounted in the same direction as the force applied to it when in operation such that the force tends to hold the cam means in a seating in the base block.

3,927,578

E-Z REMOVABLE BELT GUARD HINGE

I. W. Mattila, 1361 Azalea Ave., McKinleyville, Calif. 95521

Filed May 2, 1974, Ser. No. 466,398
Int. Cl.² F16P *1/02*
U.S. Cl. 74—608 **1 Claim**



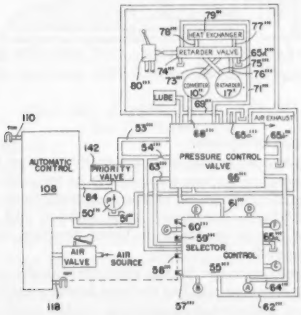
1. A removable belt guard for enclosing endless belts or chains running around pulleys or sprockets in a machine, said guard comprising a pair of half sections, one of said sections constituting an upper section and the other a lower section, each one of said half sections including a peripheral wall, a side wall on at least one side of said peripheral wall, and a hinge plate secured to each opposite end of said peripheral wall, at least one end wall plate configured for coaction with said hinge plates, pins means for releasably securing said hinge plates to said wall plate, the edges of said side walls of said two half sections abutting each other when said guard is assembled, said wall plate affording mounting of said guard to the machine.

3,927,579

DOWN SHIFT INHIBITOR SYSTEM FOR AUTOMATIC TRANSMISSION CONTROL

Kenneth Frank Golan, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 14, 1974, Ser. No. 451,012
Int. Cl. F16h *3/74*; B60k *41/18*
U.S. Cl. 74—752 C **2 Claims**



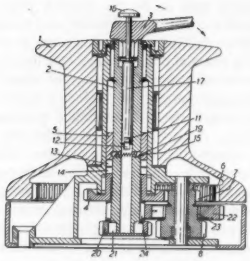
1. A hydraulic control system for a multispeed transmission having drive components associated to produce a preselected group of gear ratios in an automatic range of operation, said control system comprising: a manual control valve; a group of automatic selector valves; a power control valve; fluid conduit connections interconnecting said manual control valve with both said group of automatic selector valves and said power control valve; said power control valve connected to gear ratio control means for producing a selected gear ratio in the automatic range; governor means for simultaneously establishing plural governor pressures dependent upon transmission output speed, means for applying each of the governor pressures to a different one of the automatic selector valves, means for applying a reference pressure to each of the last-mentioned selector valves in opposition to the governor pressure, means including the selector valves responsive to variations in transmission output speed and governor pressure to automatically up shift and down shift the transmission within the automatic range of operation and up to the highest gear selected by positioning of said manual control valve; and means for inhibiting a forced down shift of said transmission as demanded by positioning of the manual control valve at a lower gear setting until a predetermined transmission output speed is reached, including a first valve member of a selector valve subjected at opposite ends thereof to said reference pressure and said governor pressure, respectively, and additional parts of a selector valve adjacent the first valve member which are inactive in said automatic up shift and down shift operation and having a first selected area against which a forced down shift pressure is applied by movement of the manual control valve to urge the first valve member in a direction opposed by said governor pressure and a larger second area which is subjected to the forced down shift pressure only after a forced down shift of the first valve member to hold the particular selector valve in downshifted position.

2. A hydraulic control system for a multispeed transmission having drive components associated to produce a preselected group of gear ratios in an automatic range of operation, said control system comprising: a manual control valve; a group of automatic selector valves; a power control valve; fluid conduit connections interconnecting said manual control valve with both said group of automatic selector valves and said power control valve; said power control valve connected to gear ratio control means for producing a selected gear ratio in the automatic range; means including the selector valves responsive to variations in transmission output speed to automatically up shift and down shift the transmission within the automatic range of operation and up to the highest gear selected by positioning of said manual control valve; governor means for simultaneously establishing plural governor pressures dependent upon transmission output speed; means for applying each of the governor pressures to a different one of the automatic selector valves; means for applying a reference pressure to each of the last-mentioned selector valves in opposition to the governor pressure to obtain said automatic up shift and down shift operation; each of the selector valves having a first valve member subject at opposite ends thereof to said opposing reference pressure and governor pressure for said automatic up shift and down shift operation and having a second valve member adjacent the first valve member and which is inactive in said automatic up shift and down shift operations and having a selected area and a larger area with said larger area selectively acted upon by the forced down shift pressure signal to hold the selector valve in a down shift position after a forced down shift has been effected; means responsive to movement of the manual control valve for selectively applying a forced down shift pressure to said selected area of one or more of the selector valves in opposition to the governor pressure whereby forced down shift occurs when the force resulting from down shift pressure exceeds an opposing force including a force from governor pressure; and means responsive to the value of governor pressure for preventing application of the forced down shift pressure signal to said larger area of the second valve member as demanded by positioning of the manual control valve until a predetermined transmission output speed is reached whereby down shift of the transmission is inhibited.

3,927,580
DISENGAGING CLUTCH SYSTEMS FOR A THREE-SPEED WINCH

Derek James Fawcett, Havant, England, assignor to Lewmar Marine Limited, Havant, England

Continuation-in-part of Ser. No. 267,948, June 30, 1972, abandoned. This application Nov. 6, 1973, Ser. No. 413,254
Claims priority, application United Kingdom, July 2, 1971, 31197/71
Int. Cl.[2] F16H *5/52*; B66D *1/30*
U.S. Cl. 74—812 12 Claims



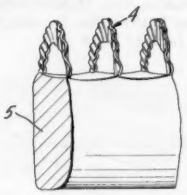
1. A winch in which there are more than two drive trains between a drive shaft and the winch drum offering respectively different drive ratios of drive of the drum in one sense of rotation, at least one of the driving trains having a disconnectable drive means, the ratios being successively engageable by successively opposite directions of rotation of the drive shaft, a preselector operable to determine which one of two of the said drive ratios engageable upon a given said direction of rotation of the drive shaft will be engaged, the preselector being thus operable by causing connection or disconnection of the disconnectable drive means in one of the said drive trains, and means automatically to disconnect the disconnectable drive means only upon reversal of the drive shaft from the given said direction of rotation.

2. A multispeed winch having a static body, a drum, bearing means supporting the drum on the body for rotation about an axis of rotation, a drive shaft, bearing means supporting the drive shaft in the body for rotation about the same axis of rotation, a plurality of drive linkages between the shaft and the drum operable to drive the drum in a single sense of rotation at different speeds upon successive rotation of the drive shaft at the same speed in successively opposite senses of rotation, one of the drive linkages including a manually engageable coupling means having engageable driving and driven members whose engagement constitutes engagement of the coupling, in which condition the driving member is arranged to drive the driven member unidirectionally in a driving sense of rotation upon relative rotation of the driving and driven members in one direction of rotation, the driving member, at least when the coupling means is engaged being operatively connected to the drive shaft for rotation when the drive shaft rotates in either sense, and means for automatically disengaging the coupling only when the drive shaft rotates in one sense of rotation relative to the static body of the winch, the drive linkage in at least the highest of the drive ratios including a unidirectional drive means oriented to prevent relative rotation of the driving and driven members in the sense opposite to the said one direction of rotation by the drum through that linkage.

3,927,581
METHOD FOR MANUFACTURING DRY SHAVER-CUTTER UNIT

Alojzy Antoni Kolodziej, Stobhill, Northcumberland, England, assignor to Ronson Products Limited, England

Filed Mar. 28, 1974, Ser. No. 455,535
Claims priority, application United Kingdom, Apr. 2, 1973, 15759/73
Int. Cl.[2] B21K *11/00*; B26B *19/04*
U.S. Cl. 76—104 R 12 Claims



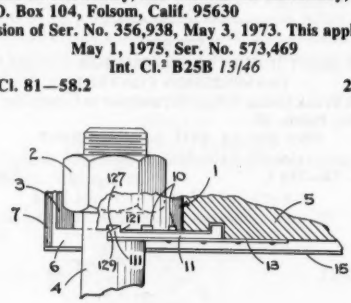
1. A method for making a cutter unit for a dry shaver assembly comprising the steps of providing an elongated strip of cutter material, forming in said strip undulations extending in a longitudinal direction of said strip, winding said strip edgewise into a helical configuration, providing a longitudinal support member for said strip; and embedding portions of said strip in said longitudinal support member to mount said strip thereupon.

4. A cutter unit for a dry shaver assembly comprising an elongated strip of cutter material, said strip being wound edgewise in a helical configuration, undulations extending in a longitudinal direction of said strip, and a longitudinal support member having parts of said strip embedded therein for mounting said strip upon said support member.

3,927,582
OPEN END ONE-DIRECTION RATCHET WRENCH

Nicholas L. Hertelendy, and Nicholas A. Hertelendy, both of P.O. Box 104, Folsom, Calif. 95630

Division of Ser. No. 356,938, May 3, 1973. This application May 1, 1975, Ser. No. 573,469
Int. Cl.[2] B25B *13/46*
U.S. Cl. 81—58.2 2 Claims



1. A wrench comprising:
a wrench handle having a socket member on at least one end thereof to surround an item to be torqued;
a gripping member within said socket member to turn with said handle in one direction of rotation and to index relative to said handle in the other direction of rotation of said handle;
said gripping member having circumferentially positioned radially directed notches thereon forming ratchet teeth; a pair of diametrically positioned ratchet pawls engaging said notches, and positioned to block relative rotation in one direction between said gripping member and said handle while allowing relative rotation in the other direction between said gripping member and said handle;

said socket member and said gripping member each having an opening in their peripheries to receive an item to be torqued;

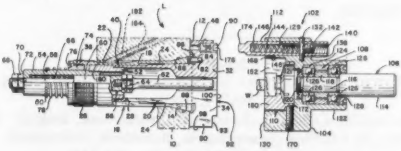
said gripping member having an indentation around its outer periphery;

a substantially radially directed member, spring biased and positioned adjacent said indentation within said handle to hold said gripping member in position.

3,927,583
APPARATUS FOR LOADING A WORKPIECE INTO A ROTATING COLLET OR CHUCK

Parsons, Hubert J., Horseheads, and Anders Adolf Peterson, Elmira, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,611
Int. Cl.² B23B *13/02*
U.S. Cl. 82—2.5 **16 Claims**



1. Apparatus for loading a workpiece into a rotating collet or chuck wherein the collet or chuck includes a projection on the face thereof offset from its axis of rotation, said apparatus comprising:

a. a loading head.

b. means for rotatably supporting said loading head coaxially with the collet or chuck,

c. said loading head including a face substantially perpendicular to the axis of rotation of said loading head,

d. means on said loading head face for mounting work gripping means thereto,

e. pin means for engaging the projection on the face of the collet or chuck as it rotates,

f. said pin means being mounted on said loading head and projecting beyond said loading head face at a point offset from the axis of rotation thereof,

g. means associated with said loading head for yieldably supporting said pin means against a force acting thereon in a direction substantially normal to said loading head face, and

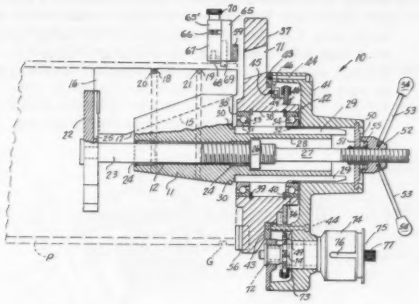
h. means associated with said pin means and said loading head for adjusting the distance said pin means projects beyond said loading head face.

3,927,584
PIPE END FACING AND GROOVING MACHINE

Johnny W. Mayfield, 4505 Greenstone Road, Placerville, Calif. 95667

Filed Mar. 5, 1975, Ser. No. 555,345
Int. Cl.² B23B *3/22*
U.S. Cl. 82—4 C **5 Claims**

1. A pipe end facing and grooving machine comprising a mandrel, means on said mandrel for engaging the inner face of a pipe adjacent one end thereof, a head plate journalled on said mandrel and adapted to rotate thereabout, means connected to said mandrel and engaging said head plate for moving said head plate axially with respect to said mandrel, a power driven hub secured to said last named means, and means extending between said power driven hub and said head for rotating said head from said power driven hub, a facing tool secured to said head adjacent the bottom thereof on the side thereof toward said mandrel for engaging and dressing the end of a pipe, a grooving tool for engaging and cutting a groove in the end portion of said pipe with said tool adjustably mounted on the upper portion of said head and resilient means between said head and said grooving tool for

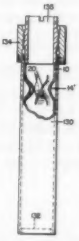


maintaining said tool in contact with the outer face of said pipe.

3,927,585
ADJUSTABLE LINER

Richard Arnold Austin, 35 Ohio Ave., West Springfield, Mass. 01089

Filed Feb. 21, 1975, Ser. No. 551,597
Int. Cl.² B23B *25/00*
U.S. Cl. 82—38 A **10 Claims**



1. An adjustable support for supporting bar or tube stock concentrically within a turning machine spindle, or feeder or stock support tube, comprising a liner having a plurality of collapsible sections, and means for collapsing the collapsible sections for movement into gripping relation to the bar or tube stock, the sections defining a fixed centerline coincident with the centerline of the turning machine spindle, or feeder, or stock support tube.

3,927,586
MICROFICHE DELETER APPARATUS

Augustus W. Griswold, 2 Pine Tree Trail, Rush, N.Y. 14543, and Boris W. Haritonoff, Pole Bridge Road, Geneseo, N.Y. 14454

Filed Jan. 29, 1973, Ser. No. 327,499
Int. Cl.² B26D *3/08*
U.S. Cl. 83—8 **14 Claims**

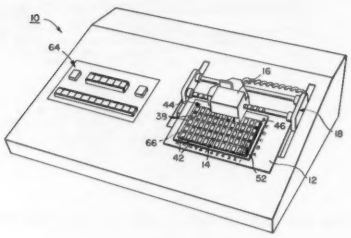
1. Apparatus for preparing an updated microfiche, wherein said microfiche is of the type including a base and a plurality of microfilm frames removably mounted on the base, comprising:

a. a support including a deck on which a microfiche can be mounted;

b. a knife carriage, including a knife blade;

c. an X-Y detented slide system for movably mounting said carriage on said support for X-Y movement of said knife blade above said deck;

d. means for mounting said knife blade in said knife carriage for movement toward a microfiche mounted on said deck, said X-Y detented slide system including detents such that said blade can be detent positioned to cut through each side edge of each microfilm frame mounted on said microfiche;



e. said knife carriage including a solenoid connected to said knife blade for, when energized, pushing said knife blade completely through only the entire thickness of the microfilm mounted on said base, and not completely through the base, and

f. said deck including a plurality of registration pins for use in mounting a microfiche on said deck in a predetermined registration, whereby a microfilm frame to be removed can be cut away, at each side edge thereof, from the adjoining microfilm frames by said knife blade for removal from the microfiche base.

3,927,587

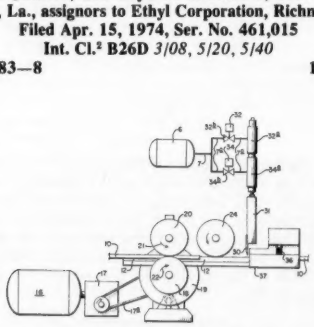
GASKET CUTTING APPARATUS

James C. Jackson, and Loyd D. Harberson, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Apr. 15, 1974, Ser. No. 461,015

Int. Cl.² B26D *3/08*, *5/20*, *5/40*

U.S. Cl. 83—8 **11 Claims**



1. An apparatus for notching and severing a flexible gasket means comprising:

a. motor means;

b. clutch means;

c. drive wheel means connected to said motor means by said clutch means for moving said gasket means;

d. idler wheel means adjacent to said drive wheel means for forcing said gasket means against said drive wheel means;

e. guide means located between said idler wheel means and said drive wheel means for guiding said gasket means between said idler wheel means and said drive wheel means;

f. measuring wheel means located adjacent to said guide means for measuring said gasket means at a first series of preset intervals and at a second series of preset intervals as said gasket means is driven along said guide means;

g. knife means located adjacent to said guide means for notching said gasket means at said first series of preset intervals and for severing said gasket means at said second series of said preset intervals after said gasket means has been notched in accordance with said first series of preset intervals;

h. counter means connected to said clutch means and said measuring wheel means for (i) measuring the length of said gasket means traveling beneath said measuring wheel means and (ii) for de-energizing said clutch means to engage and disengae said clutch means at preset intervals; and,

i. air cylinder means connected to said knife means and said counter means for actuating said knife means for notching said gasket material at said first series of preset intervals and for severing said gasket means at said second series of said preset intervals after said gasket means has been notched in accordance with said first series of preset intervals.

3,927,588

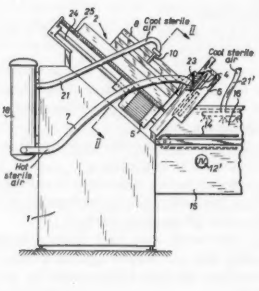
ASEPTIC SLICING MACHINE FOR FOOD PRODUCTS, AND METHOD

Hans Rudolf Laderach, Basenheid, Switzerland, assignor to Micarna AG Fleischwarenfabrik, Bazenheid, Switzerland

Filed July 22, 1974, Ser. No. 490,518

Int. Cl.² A23B *4/06*; B26D *4/22*

U.S. Cl. 83—15 **11 Claims**



1. Method of aseptically severing meat products, sausage products, cold cuts, and the like, utilizing a slicing machine having a moving cutting knife sequentially severing slices of said meat products from a bulk supply

comprising the step of

continually blowing air at a temperature in excess of 100° C against said cutting knife to continuously maintain the cutting knife (4) of the slicing machine during the cutting operation at a temperature which is at least the minimum sterilization temperature and to heat the cutting knife to a temperature in excess of 100°C.

3,927,589

METHOD AND APPARATUS FOR OPENING LETTER ENVELOPES

Erwin J. Emkjer, Boca Raton, and L. Kenneth Tucker, Miami Lakes, both of Fla., assignors to Kenematic Company Inc., Plantation, Fla.

Continuation-in-part of Ser. No. 275,560, July 27, 1972, abandoned. This application July 9, 1973, Ser. No. 377,427

Int. Cl.² B43M *7/02*

U.S. Cl. 83—23 **16 Claims**

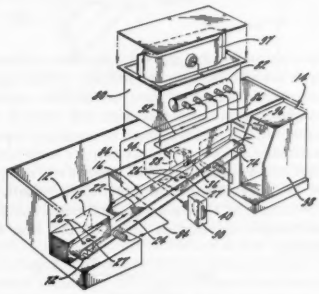
1. Apparatus for opening letter envelopes or the like, comprising, in combination:

a feed hopper adapted to receive a stack of unopened envelopes lying on one another;

an output hopper adapted to receive said envelopes after they have been opened;

a flexible transport belt movable around a loop, the upper portion of which extends from beneath the upstream side of said feed hopper to a point adjacent said output hopper for successively transporting individual envelopes from the bottom of said stack in said feed hopper to said output hopper;

means for guiding said envelopes as they are transported to said output hopper, said guide means including a support transport guide portion lying substantially in the same plane as said upper portion of said belt and a generally vertical rear transport guide portion intersecting said support guide portion for accurately positioning said envelopes for engagement with said cutting means during movement of said envelopes, said generally vertical rear transport guide portion having a portion near said support guide portion that is positioned at an acute angle relative



to said support guide portion so that said envelopes are restrained from moving upwardly from said support guide portion during transport thereof;

means for cutting a longitudinal edge of said envelopes as they are transported to said output hopper, said cutting means being located adjacent said guide means;

means for urging said longitudinal edge of said envelope to firmly abut against said guide means during transport to insure substantially complete cutting of said longitudinal edge; and

a vacuum manifold and a vacuum supply connected thereto, said manifold being positioned immediately below the upper portion of said loop and extending longitudinally from a point below said stack in said feed hopper to a point beyond said cutting means, said belt including at least one aperture therein for communicating vacuum to said envelopes for holding said envelopes to said belt during transport thereof from said feed hopper stack, past said cutting means, and to a point beyond said cutting means.

3,927,590

APPARATUS FOR PRODUCING ELECTRICAL CONDUCTORS OF MEASURED LENGTH

Ragnar Gudmestad, West Allis, and Sven O. Sandblom, Greendale, both of Wis., assignors to Artos Engineering Company, New Berlin, Wis.

Filed Oct. 10, 1974, Ser. No. 513,937
Int. Cl.² B26D *7/14, 5/20*
U.S. Cl. 83—151 **9 Claims**

1. An apparatus for producing electrical conductors of measured length from a continuous supply wire, comprising:

a frame;

an endless elongated track mounted on said frame in a fixed position presenting laterally spaced track stretches extending between front and rear ends thereof;

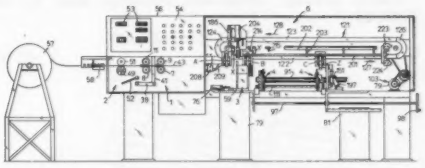
a plurality of wire transfer clamps movable in series around said track and each comprising a pair of complementary wire gripping jaws adjustable to closed and open positions;

drive means for intermittently and successively circulating said clamps forwardly along one of said track stretches and rearwardly along the other;

a clamp holding gate at the rear end of said track;

a clamp starting gate spaced forwardly from said holding gate along said one track stretch;

a clamp intercepting gate spaced forwardly of said starting gate along said one track stretch;



control means for said wire gripping jaws of said clamps and for said holding, starting and intercepting gates operable in timed relation to each other so that one of said clamps will advance a leading end of said supply wire from said starting gate toward said intercepting gate while another of said clamps advances idly from said intercepting gate toward said holding gate, and still another of said clamps advances idly from said holding gate toward said starting gate; and

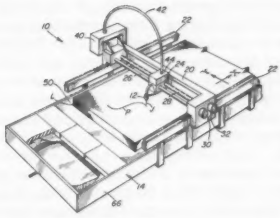
wire cutting means operable after said leading end of said supply wire has been advanced to said intercepting gate to sever said supply wire between said starting and intercepting gates in proximity to said starting gate.

3,927,591

SUPPORT BED FOR SHEET MATERIAL CUT BY A FLUID JET

Heinz Joseph Gerber, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed July 15, 1974, Ser. No. 488,319
Int. Cl.² B32B *3/12*
U.S. Cl. 83—177 **15 Claims**



1. In combination in a cutting apparatus having a high velocity fluid cutting jet issuing from a nozzle translated in parallel relationship relative to and above sheet material in a cutting operation, an improved bed for supporting sheet material under the jet comprising:

a laminated structure penetrable by the jet and having:

an upper layer defining a support surface on which the sheet material is spread;

a lower layer spaced from and underlying the upper layer; and

an intermediate layer between the upper and lower layers and formed from a severable and self-healing material, the upper and lower layers being formed from a barrier material for holding the self-healing material of the intermediate layer in place between the upper and lower layers; and

means disposed below the laminated structure and defining a fluid collection chamber for receiving the spent fluid from the jet.

3,927,592

APPARATUS FOR SAWING UP FLAT, RECTANGULAR BLOCKS, IN PARTICULAR DEEP-FROZEN BLOCKS OF FISH

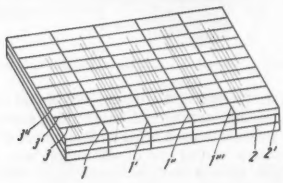
Heinz Nienstedt, Zum Nonnenberg 8a, 435 Recklinghausen, Germany

Filed Jan. 30, 1974, Ser. No. 437,956

Claims priority, application Germany, Feb. 9, 1973, 2306343

Int. Cl.² B26D *5/00, 4/00*

U.S. Cl. 83—404.2 **4 Claims**



1. An apparatus for sawing up flat, rectangular blocks into rectangular sticks, consisting of several saws which divide the blocks into smaller and smaller rectangular units by vertical cuts, and transport devices between the individual saws for the smaller units, an indented block saw having a saw table; transport devices on said saw table for transporting the blocks during cutting, a slab saw for concurrently dividing the smaller units coming from the block saw into even smaller units; a stick saw for dividing the units coming from the slab saw into sticks, and an apparatus placed after the block saw for turning over and separating the slabs, from which the slabs are carried on their sides by means of one of the transport devices to the later saws, characterized in that the indented block saw (**4**) dividing the blocks (**25**) into individual bars with individual consecutive cuts, the said transport device (**6**) sequentially conveying the bars to the slab saw (**5**), said one transport device having a change-over table divided into three parts in the direction of transporting including front, middle and back parts; means for moving the front and the back parts (**13, 11**) into a position outside the transport path of the middle part (**12**) and into the transport path of the saw table (**17**) and back into the transport path of the middle part (**12**) for repeatedly carrying the blocks (**25**) on the saw table (**17**) for them to be divided into bars, a buffer guide **26** being mounted on the middle part (**12**) of the saw table, said buffer guide/being set to the width of the bar to be sawn off, and the one transport device (**6**) being fastened to the front part (**13**) of the change-over table which is movable in the transport path of the saw table (**17**), and the turning and slab separating apparatus (**30, 7**) being positioned between the slab saw (**5**) and the stick saw (**8**).

3,927,593

AFTER-CONTROL SIGNAL DETECTING SENSOR FOR KEYBOARD OF ELECTRONIC MUSICAL INSTRUMENT

Kiyoshi Kawamura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Dec. 26, 1974, Ser. No. 536,480

Claims priority, application Japan, Dec. 28, 1973, 49-4230

Int. Cl.² G10H *1/00*

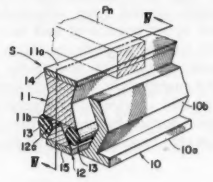
U.S. Cl. 84—1.01 **7 Claims**

1. An after-control signal detecting sensor positioned at a distance below keyboard of an electronic musical instrument to correspond to the respective depressable keys and connected to a circuit of said musical instrument, comprising:

an electrically insulated open-top casing having a bottom wall and opposing holding side walls extending from said bottom wall,

a flexible, elastic first conductive member slidably fitted in the opening of said casing and having a flexible first electrode and capable of varying its resistance in accordance with its compression and deformation caused when pressed by each key,

a second conductive member having a second electrode and being supported on the bottom wall of said casing therein



and separated with a gap from said first conductive member in the non-compressed normal state of the first conductive member, said first conductive member being brought into area contact with said second conductive member under forces applied by each key depressed, and electrically insulated pressor-stopper members provided inside said casing at opposite sides of the second conductive member and so positioned as to maintain said gap between the first and second conductive members in said non-compressed normal state of the first conductive member.

3,927,594

PIANO ACTION

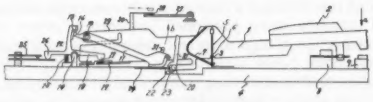
Masanori Morita, Osaka, Japan, assignor to Roland Corporation, Osaka, Japan

Filed Oct. 21, 1974, Ser. No. 516,218

Claims priority, application Japan, Oct. 26, 1973, 48-121127; Aug. 5, 1974, 49-90118

Int. Cl.² G10C *3/18*

U.S. Cl. 84—237 **9 Claims**



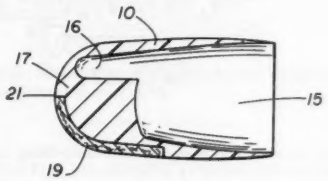
1. In a musical instrument having at least one key adapted to move from a first to a second position upon external activation and further having sensor means for creating a sound when struck, a key action comprising, in combination, a base; a key extension member pivotally supported on said base and having a first end portion connected to said key whereby said key extension member moves in correspondence to the movement of said key, a projecting portion, and a second end portion; striking means pivotally mounted on said second end portion and having a free end portion adapted to receive a restraining force and a striking portion adapted to rotate from a rest position to a striking position striking said sensor means upon movement of said second end portion of said key extension member while said free end portion is acted upon by said restraining force; and restraining means mounted on said base and having a restraining portion for applying said restraining forces to said free end portion of said striking means while said key moves from said first to said second position, and an activating portion adapted to cooperate with said projecting portion of said key extension member to disengage said re-

straining portion of said restraining means from said free end portion of said striking means after striking of said sensor means, whereby said striking means rotates back toward said rest position following the striking of said sensor means.

3,927,595
GUITAR FINGER SHIELD

Laureen M. Ferguson, Pierrefonds, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Mar. 10, 1975, Ser. No. 556,903
Int. Cl.² G10D *3/16*
U.S. Cl. 84—322 **1 Claim**



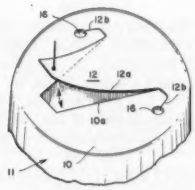
1. A finger shield, in the form of a cap, for use in playing a guitar which permits a finger enclosed in the shield to finger the strings of the guitar in conventional fashion comprising

a cap shaped member formed of flexible material with an internal recess, open at one end, of a size to enclose the tip of a finger, said recess formed with a further recess in the closed section of the cap of a size to fit about the nail of a finger enclosed by the cap shaped member, with an insert of semi-rigid properties integrally fastened on the external portion of the cap adjacent to the tip of an enclosed finger, in the installed position.

3,927,596
VOLUME CONTROL FOR REED ORGAN

Harold B. Martin, 19 Rosemere Ave., West Caldwell, N.J. 07006, and Herman O. Rogg, 94 Brook Drive, Watchung, N.J. 07060

Filed Mar. 10, 1975, Ser. No. 556,731
Int. Cl.² G10B *1/08, 3/02*
U.S. Cl. 84—355 **8 Claims**



1. In combination with a reed organ having an air chamber, an air moving means, a reed and reed actuating means, a volume control, which comprises:

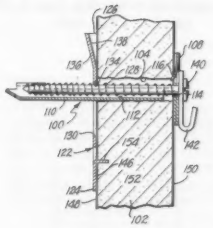
a temporarily deformable tongue cut out from a portion of the reed chamber and having a root portion integral with said reed chamber, and

means for flexing the tongue from said reed chamber portion to permit any desired amount of air to be drawn into the chamber for pressurizing same and permitting a reed to be actuated by said activating means.

3,927,597
BLIND FASTENER

Allan C. Stults, 424 Prospect St., Newport Beach, Calif. 92660; Raymond H. Powell, 11871 Simon Ranch Road, Santa Ana, Calif. 92705, and Edward D. O'Brian, 910 Iroquois Ave., Anaheim, Calif. 92801

Filed Aug. 30, 1974, Ser. No. 502,149
Int. Cl.² F16B *35/04*
U.S. Cl. 85—3 R **6 Claims**



1. A blind fastener capable of being mounted on a support member from one side of said member for use in mounting an elongated screw on said member which comprises:

an elongated shank,

a head located on one end of said shank so as to extend outwardly therefrom,

a holder located on the other end of said shank so as to extend outwardly from said shank generally in alignment with said shank,

said holder comprising a single elongated arm, said arm having an enlarged head positioned on the extremity thereof remote from said shank,

an elongated clamp associated with said holder, said clamp being provided with a centrally located opening capable of being engaged by said screw,

said head, shank and holder being shaped so as to accommodate said screw being inserted relative to said fastener so as to extend from said head along said shank and said holder,

co-acting mounting means on said clamp and said holder (1) for positioning said clamp in an insertion position in which said clamp is generally in alignment with said shank and extends from said holder outwardly away from said shank, (2) for supporting said clamp so that it can be rotated from said insertion position to a position in which it is transverse to said shank, (3) for limiting movement of said clamp on said holder away from said shank and (4) for preventing rotation of said clamp in a plane transverse to said shank and said holder,

said co-acting mounting means comprising a hole formed in said clamp and the edges of said arm and the portions of said enlarged head adjacent to said arm, said clamp being positioned on said arm with said arm extending through said hole, said head being sufficiently large so as to prevent movement of said clamp off of said arm during the normal operation of said fastener, and

deflecting means on one end of said clamp, said end of said clamp containing said deflecting means being adapted to be positioned adjacent to said shank when said clamp is in said insertion position,

said deflecting means being capable of being engaged by said screw when said screw is inserted so as to extend from said head and said shank into said holder so as to cause said clamp to be rotated from said insertion position to a sufficient extent so that said screw is further inserted, the contact of said screw with said opening in said clamp during such further insertion serving to push said clamp away from said shank until further movement of said clamp is arrested by said holder when said screw

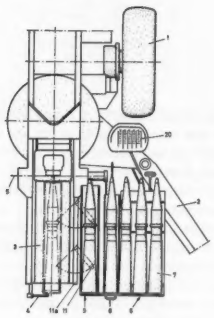
will engage the interior of said opening, further rotation of said screw upon such engagement serving to draw said clamp toward said shank.

3,927,598

DEVICE FOR LOADING AN ARTILLERY PIECE

Carl-Erik Eriksson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Mar. 25, 1974, Ser. No. 454,499
Claims priority, application Sweden, Apr. 2, 1973, 7304589
Int. Cl.² F41F 9/06
U.S. Cl. 89—45 6 Claims



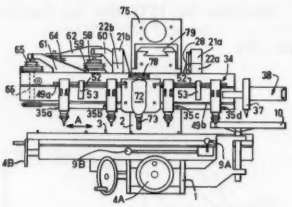
1. A loading device for loading an artillery piece, particularly a heavy artillery piece, comprising a loading table, a feeding mechanism, and transferring means, said loading table comprising means for carrying a number of rounds thereon, said feeding mechanism being operative to feed the rounds, one at a time, from said table to said transferring means to transfer the rounds from the loading table to a ramming position at the barrel of the piece, the loading table being connected with the traversing parts of the piece and being located at the rear at the side of the barrel with the plane of said table being inclined towards said side of the barrel, the feeding mechanism comprising a plurality of selectively movable cams disposed in spaced relation to one another adjacent said table and arranged to keep the rounds oriented on said table substantially parallel to a vertical plane through the axis of the bore of the piece, and an actuating member operative to move said cams to achieve a controlled rolling of the rounds laterally along said inclined table towards the transferring means, said feeding mechanism including two shafts arranged parallel to each other for rotation by means of said actuating member, said shafts being oriented at right angles to said vertical plane, each shaft carrying a first series of said cams equally distributed at fixed positions along the shaft and a second series of said cams equally distributed at fixed positions along the shaft, the cams of the second series being displaced at an angle and displaced in the longitudinal direction of the shaft in relation to the cams of the first series, said loading table having a plurality of slots therein through which the cams protrude, the distance between said slots for the cams of the first series and the cams of the second series, respectively, being greater than the diameter of the round.

3,927,599

UNIVERSAL ENGRAVING MACHINE

Jean-Louis Raymond, 5 rue de l'Hopital Saint-Louis, 75010 Paris, France

Filed Nov. 14, 1973, Ser. No. 415,562
Claims priority, application France, Nov. 24, 1972, 72.41892; Oct. 9, 1973, 73.36051
Int. Cl.² B23Q 35/121
U.S. Cl. 90—13.2 8 Claims



1. A universal engraving machine comprising, in combination:

a horizontal work table for supporting work pieces to be engraved;

tool-carrying means;

means for displacing said tool carrying means in a longitudinal horizontal direction, a transverse horizontal direction, a vertical direction and an angular direction about a longitudinal horizontal axis;

a plurality of mandrels slideably arranged in a tubular body mounted on said tool-carrying means, a plurality of engraving tools, each mounted in one of said mandrels, each mandrel being provided at a location at close proximity to the associated tool, an endless driving belt, belt-engaging means adapted to engage said endless driving belt means for rotating said mandrel and the tool mounted therein;

driving means acting on said belt for rotatively driving said mandrels and tools through said endless driving belt means at a comparatively high rotational speed;

at least one follower adapted to translationally and angularly explore a master pattern, and

adjustable pantograph means connecting said follower to said tool-carrying means for transmitting to the latter the exploring translational and angular motions of said follower with a preselected reduction ratio.

3,927,600

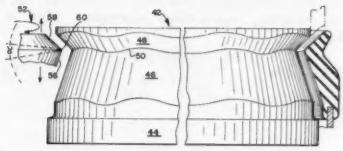
METHOD OF FORMING A MOLDING CORE FOR USE IN FORMING A SEAL UNIT

Glenn W. Peisker, Barrington, Ill., assignor to Chicago Rawhide Manufacturing Company, Elgin, Ill.

Division of Ser. No. 246,865, April 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 213,693, Dec. 29, 1971, abandoned. This application Nov. 8, 1974, Ser. No. 522,101
Int. Cl.² B23C 1/027, 1/16, 3/34
U.S. Cl. 90—11 C 5 Claims

3. A method of forming a molding core for use in molding a seal unit having a sinuously extending annular seal band, said method including providing a core blank, and cutting therein a pair of generally oppositely directed, radially undulating surfaces therein by moving radially inwardly of the axis of said core blank to a predetermined depth a cutting tool having a pair of oppositely directed, generally frusto-conical cutting surfaces thereon which meet to define a peripheral annular cutting edge, said method also including rotating said tool about its own axis, moving the center of said tool about the axis of said blank at said predetermined depth and reciprocat-

ing said cutting tool axially through a predetermined path as said tool is moved about said center of said blank whereby a



pair of axially undulating surfaces which meet along an annular line are formed in said blank.

3,927,601

DEVICE FOR MEASURING LIQUIDS OR GASSES

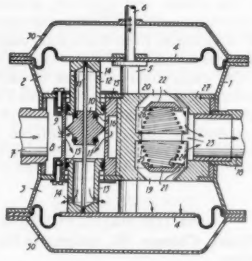
Guido Ivo Van de Moortele, Bribel, Belgium, assignor to Unitas S.A., Luxemburg

Filed Jan. 23, 1974, Ser. No. 435,766

Claims priority, application Belgium, Jan. 29, 1973, 52482; Apr. 19, 1973, 52705

Int. Cl.² F01L *15/18*; G01F *3/20*

U.S. Cl. 91—329 **3 Claims**



1. Device for measuring a liquid or gas, comprising two separate chambers with a determinated content, a common inlet for both said chambers, a common outlet for both said chambers, a hollow cylinder with radial inlet openings, being solidly fitted transversally in front of the inlet of the device, an axially sliding guide bushing positioned in each end of said cylinder and extending into the adjacent one of said chambers, each bushing being provided with a through opening interconnecting said hollow cylinder with its adjacent chamber, a rod connecting both bushings, a valve being mounted on said rod and slidable between both guide bushings from one side of said radial openings in said cylinder to the other side and closing alternately the through opening of one of said guide bushings, means in each of said chambers for expelling alternately the medium out of each chamber, said means being interconnected and adapted to move alternately said guide bushings and the valve closing one of said bushings to the other side of the radial openings of said cylinder, closing means between the outlet of the device and both of said chambers and adapted to receive actuating pressure of the expelled medium.

3,927,602

PRESSURE FOLLOW-UP CONTROL SYSTEM FOR SERVO STEERING GEARS OR SIMILAR DEVICES

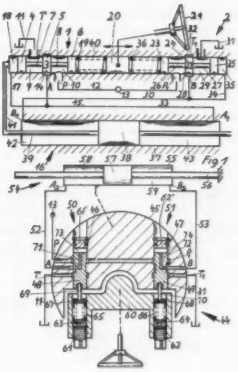
Gunther Strauff, Kaarst, Germany, assignor to Langen & Co., Dusseldorf, Germany

Filed Aug. 24, 1973, Ser. No. 391,272

Claims priority, application Germany, Aug. 26, 1972, 2242022

Int. Cl.² F15B *9/10*

U.S. Cl. 91—372 **2 Claims**



1. A fluid-pressure-responsive follow-up control system for servo-systems comprising, in combination: fluid-operated servo-motor means **(16, 54)** including two operational areas **(42, 43 & 58, 59)**;

a fluid pressure source **(13)**;

fluid outlet means (T, T_1);

an output member **(40, 45)** including mechanical feedback means operably connected to said servo-motor means **(16, 54)**;

an input member **(20, 60)** having relative movement to said output member **(40, 45)**;

a pair of control pistons **(1, 2 and 50, 51)** in said output member **(40, 45)**;

fluid connection means **(15, 33 & 52,53)** between said operational areas **(43, 42 & 58, 59)** of said fluid-servo-motor means **(16, 54)** and said control pistons; **(1, 3, 50, 51)**

said control pistons **(1, 3, 50, 51)** including control portions selectively connecting via said fluid connection means **(15, 33, 51, 53)** said operational areas **(42, 43, 48, 49)** with said fluid pressure source **(13)** or said fluid outlet means (T, T_1) in response to slight relative movements between said input **(20,60)** and output member **(40, 45)** or blocking said fluid connection means **(15, 33, 42, 53)** from said fluid pressure source **(13)** and said outlet means (T, T_1) in a neutral position;

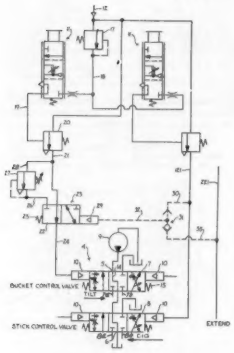
each control piston **(1, 2, 50, 51)** including at least one fluid pressure reaction area **(18, 35, 33, 74)** in communication with said fluid connection means **(15, 33, 52, 43)**;

spring means **(65,66,14,36)** interposed between said input member **(10,60)** and said control pistons **(1, 3, 50, 51)**; said spring means **(14,36,65,66)** imposing residual biasing forces on said control pistons **(1,2,50,51)** contrary to the force caused by fluid pressure on said reaction areas **(18,35,73,74)**.

3,927,603
CONTROL MEANS FOR A PAIR OF FLUID MOTORS

Gerald W. Bernhoft, Milwaukee, Wis., assignor to Koehring Company, Milwaukee, Wis.

Division of Ser. No. 262,024, June 12, 1972, Pat. No. 3,883,023. This application May 24, 1974, Ser. No. 473,283
Int. Cl.² F15B *13/08*
U.S. Cl. 91—412 5 Claims



1. A fluid pressure system of the type wherein pressure fluid from a source is directed to a fluid motor in consequence of pilot actuation by a pilot valve of the valve element of one control valve to an operating position provided the valve element of another pilot operated control valve is in either a neutral position or has been displaced from neutral in one direction, against spring bias, partway toward a full flow operating position characterized by:

A. means providing a pair of fluid pressure actuators, one for each control valve and operatively connected with the valve element thereof;

B. a pilot circuit for each actuator, the pilot circuit for said other control valve having a fluid pressure supply duct with a branch leading therefrom;

C. a valve instrumentality normally occupying a position connecting the actuator for said other control valve with said duct, said valve instrumentality being movable to another position to communicate said last named actuator with said duct through said branch thereof;

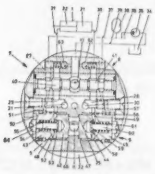
D. a pressure control instrumentality in said branch rendered operative in said other position of said valve instrumentality effect subjection of the actuator for said other control valve to pressure at a value less than that present in said supply duct and so preselected that said pressure control instrumentality is cooperable with the spring bias on the valve element of said other control valve to hold the valve element thereof in a position between its said neutral and full operating positions;

E. and means for effecting actuation of said valve instrumentality to said other position thereof in response to a signal produced as a consequence of actuation of said pilot valve for said one control valve.

3,927,604
POWER STEERING SYSTEM WITH REACTION FORCE LIMITING MEANS

Erich Jablonsky, Bobingen, Rems, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Continuation-in-part of Ser. No. 266,053, June 26, 1972, Pat. No. 3,855,904. This application May 7, 1973, Ser. No. 357,603
Claims priority, application Germany, May 6, 1972, 2222334
Int. Cl. F15b *13/14*
U.S. Cl. 91—434 15 Claims



1. In combination with a fluid power steering device having a source (**38**) of fluid medium under a storage pressure, a fluid motor (**1**) having a pressure chamber (**21** or **22**) and control valve means (**8**) displaceable from a neutral position for supply of the fluid medium to the pressure chamber under an operating pressure, said control valve means including means operative in said neutral position for blocking flow of the fluid medium from the source, and operating pressure responsive means for producing reaction force to resist said displacement of the control valve means from the neutral position including a force limiting piston (**43** or **45**) having opposed pressure faces (**50** or **56**) respectively exposed to said storage and operating pressures to limit the reaction force and force transmitting means (**42** or **44**) connected to the forces limiting piston and operatively engageable with the control valve means for exerting said reaction force thereon.

3,927,605
LINKAGE-DRIVE PUMP

Bernard W. Siczek, Chicago, Ill., assignor to Graco Inc., Minneapolis, Minn.

Filed Feb. 25, 1974, Ser. No. 445,711
Int. Cl.² F01B *31/14*; F15B *15/24*; F04B *14/00*
U.S. Cl. 92—13.1 6 Claims

1. A fluid pumping apparatus of the type driven by a rotating shaft wherein fluid is delivered at an elevated pressure through a delivery means and fluid pressure is controlled by adjusting the pumping stroke, comprising:

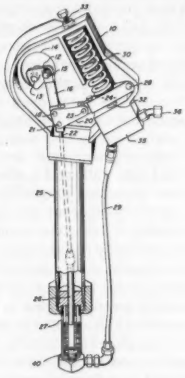
a. crank and connecting rod means attached to said shaft for translating said rotating shaft motion to reciprocating motion;

b. a pressure transducer connected to said delivery means, said pressure transducer having a movable element which activates in response to pressure in said delivery means, and a pivotal actuating member contacting said movable element, and adjustable spring biasing means contacting said pivotal actuating member for opposing the motion of said movable element;

c. fluid pumping means, connected to said delivery means, for pumping fluid into said delivery means in response to a reciprocating motion drive;

d. a fluid pump connecting rod attached to said fluid pumping means, for imparting reciprocating motion drive thereto; and

e. a triangular link having first, second, and third bearing connections near respective corners thereof, and having its first bearing connection attached to said connecting rod means, and having its second bearing connection attached to said pressure transducer actuating member, and having its third bearing connection attached to said



fluid pump connecting rod, said first and third bearing connections being in substantial reciprocating drive alignment when said pressure transducer actuating member is in a first position, and said first and third bearing connections being in substantial transverse drive alignment when said pressure transducer actuating member is in a second position.

3,927,606

METHOD FOR MAKING A CROSS-BOTTOM BAG HAVING A PLASTICS LINER INCORPORATED IN THE FOLDING OF THE END CLOSURE

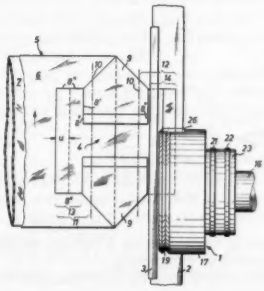
Friedrich Franz Brockmuller; August Schwarzkopf, and Richard Feldkamper, all of Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed Feb. 26, 1974, Ser. No. 445,842

Claims priority, application Germany, Mar. 2, 1973, 2310605

Int. Cl.² B31B 1/22

U.S. Cl. 93—35 SB **4 Claims**



1. A method of making a multi-layer cross-bottom bag consisting of an outer layer of at least one ply and an inner layer having adhesion properties different from those of the outer layer, wherein a longitudinally fed flattened tubular web consisting of the material for the inner and outer layers is produced in a tube-forming machine and divided into individual bag sections, two longitudinal incisions are applied through both layers at least near one end of the bag sections at least on the side of the section adjacent to the side flap that is to be folded over last of all, whereby the corner folds of the end closure are at least partially separated from the side flaps of the end closure to define rectangular tongue portions on the side flaps, and wherein a cross-bottom is formed on at least one end of each bag section whilst being fed transversely in a base-forming machine by opening up the or each end of the bag section, foreshortening the outer edge of the tongue portion on the side flap of the inner layer that is to be folded over last of all in comparison with the corresponding edge of the innermost ply of the outer layer by severing a correspondingly wide strip from the tongue portion, leading the leading edge of the strip being severed out of the plane of movement of the bag section whilst the latter is passing a severing element disposed at a fixed location, applying a suitable adhesive to the faces of the inner and outer layers that are to be stuck together, and turning over the side flaps that are to be folded over first of all and last of all.

3,927,607

DEFROSTER OUTLET

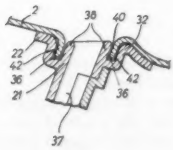
Wolfgang Jobst, Sudring, Germany, assignor to General Motors Corporation, Detroit, Mich.

Filed May 17, 1974, Ser. No. 470,831

Claims priority, application Germany, Aug. 11, 1973, 2340749

Int. Cl.² B60H 1/00

U.S. Cl. 98—2.09 **2 Claims**



1. A defroster outlet nozzle assembly to direct a flow of air through an instrument panel having an opening therethrough formed by a relatively rigid and depending edge portion; said nozzle having parallel, elongated side walls defining a constant flow area along its length for the passage of air to be discharged against a windshield; means adjacent said side walls and operably connected to said side walls for engaging the edge portion of the instrument panel and preventing movement of said side walls toward one another caused by heat distortion; said means including a flange portion generally extending in a direction transverse to the flow of air through said nozzle; elongated groove means formed in said flange and parallel to said side walls defining a cavity presenting an upward-facing opening adapted to operatively receive said depending edge portion of said instrument panel thereby providing lateral support for said side walls to prevent relative movement therebetween which may be caused by thermal stresses.

3,927,608

BEVERAGE MAKING DEVICE

John S. Doyel, 404 W. 20th St., New York, N.Y. 10011

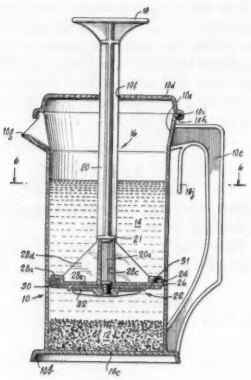
Filed June 14, 1974, Ser. No. 479,521

Int. Cl.² A47J 31/38, 31/06

U.S. Cl. 99—297 **20 Claims**

10. A device for filtering solid particulate material from a liquid comprising: a container for the liquid and the solid particulate material, said container having an axially extending, tubular sidewall; a piston means for moving said piston axially within the container; a first solid ring which is secured to the piston in a plane transverse to the container axis and

whose outer circumferential edge has radially extending projecting portions which contact the container sidewall and are circumferentially spaced from each other by indentations spaced inwardly from the container sidewall to form thereby a first clearance between the sidewall and the first ring which allows flow of said liquid therethrough but is smaller than a first selected particle size of said solid particulate material, said first ring being C-shaped, with a gap between the two circumferentially facing edges; whereby when the piston is moved axially in the container said liquid passes through said clearance but the solid particulate material over said first



selected size does not and remains ahead of the first ring in the direction of said axial movement.

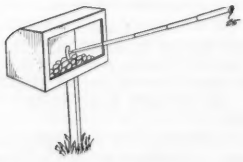
17. A plunger for a beverage making device comprising: a rod having a first end and a second end; a handle connected to the first end of said rod; a piston connected to the second end of the rod; and a pair of annular, solid inserts mounted on said piston, extending radially outwardly from at least a major portion thereof and having radially outer circumferential edges which are formed with circumferential rows of projecting portions spaced circumferentially from each other by indentations extending radially inwardly and having a selected size.

3,927,609

WIENIE WIGGLER ROASTING IMPLEMENT

Ronald J. Scott, 3783 Creekview Drive, Cincinnati, Ohio 45241

Filed Mar. 14, 1974, Ser. No. 450,988
Int. Cl.[2] A47J *37/04*
U.S. Cl. 99—419 **2 Claims**



1. A culinary implement for the roasting of wienies, marshmallows, and the like, comprising:

a plurality of elongated cylindrical tubular segment members telescopically disposed relative to each other and moveable between a collapsed storage and carrying position and an extended telescopic operative position, said segments including a back handle segment and a front fork carrying segment, each segment being defined by an elongated cylindrical configuration having a closed disc shaped back end, depending cylindrical type walls, and an open front end, and wherein each segment is of a different diameter to permit the telescopic collapsing and extension of said segments relative to each other, wherein said front fork segment further comprises a passageway extending through the front open end thereof, a wall surface disposed normal to the longitudinal axis of said passageway and afixed in said passageway in a position inwardly of said segment front end, an L-shaped slot disposed in said side wall, said L-shaped slot comprising a ledge portion extending longitudinally along said side wall from a position adjacent said open front end to a position outwardly of said inner wall, and a foot portion extending circumferally of said side wall, a disc member of a diameter adapted to be received in said passageway disposed normal to the longitudinal axis of said passageway, an operating member afixed to the peripheral edge of said disc member and adapted to pass through said side wall slot for engagement exteriorly of said side wall, a coiled spring disposed intermediate a back surface of said disc member and a confronting surface of said inner wall, a clip afixed to a front surface of said disc member, and a generally V-shaped resilient fork member having its apex afixed to said clip member with its legs defining prong members, said fork member being of a length to be completely received in said fork segment when said operating member is in said slot put portion;

means adapted to retain the telescopic extended positions between adjacent segments; and

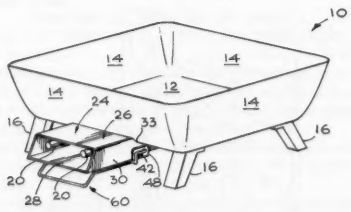
a spring loaded fork assembly disposed in said fork segment and adapted to be moved between a collapsed storage position disposed inwardly of said front fork segment and an operative position extending outwardly of said front fork segment.

3,927,610

AUXILIARY COOKING UTENSIL LEG

Norman C. Minsky, and Russell D. Hiatt, both of West Bend, Wis., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed Apr. 24, 1975, Ser. No. 571,127
Int. Cl.[2] A47J *36/34, 37/10*
U.S. Cl. 99—425 **6 Claims**



1. In a cooking vessel having a bottom and sidewalls, an auxiliary leg assembly comprising:

an electrical terminal housing located adjacent said bottom, said housing including a top and bottom wall and opposing sidewalls having an inner aperture located therein;

a generally U-shaped pivot bracket having opposing sidewall portions and an elongated base, said bracket including an outer aperture on each sidewall portion thereof and being positioned to locate said outer apertures over a corresponding inner aperture in each of said housing sidewalls; and,

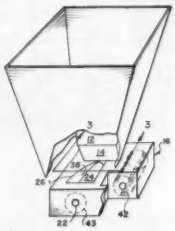
a leg structure having a base portion and inwardly directed opposing upper end portions each having a terminal end resiliently engaging each of said apertures for rotation about a line defined by the center axis of said apertures.

3,927,611

DOUGH DEGASSER AND DEVELOPER

Gregory C. Papalexis, Cambridge Way, Alpine, N.J. 07620, and Richard I. Elliott, 103 Penfield Ave., Croton On Hudson, N.Y. 10520

Filed Feb. 15, 1973, Ser. No. 332,683
Int. Cl.² A21C *3/00*, *11/00*; A23G *1/22*, *3/00*
U.S. Cl. 99—472 9 Claims



1. An integrate dough degasser and developer control system for automatic processing of yeast raised dough comprising in combination

a hopper having an upper section and a narrow bottom end, and at least three sides: an anti-wedge for rapid dough flow integrally connected to one of said sides and within the inner surface of said hopper for receiving dough by gravity action;

a dough degassing and developing control unit having a top surface connected to the narrow end of said hopper for removing excess gas from yeast raised dough and homogeneously mixing said dough prior to further processing; wherein said control unit further comprises:

a bottom surface;

an entry port located on said top surface and in juxtaposition to the narrow end of said hopper for receiving said dough, and an exit port located on said bottom surface; a first chamber having entrance and exit ends, said entrance end connected to said entry port for degassing and compressing said dough;

a second chamber having entrance and exit ends, said entrance of said second chamber connected to the exit end of said first chamber, said exit end of said second chamber connected to the exit port on bottom surface of said control unit; and,

a vacuum port located at entrance of said first chamber for removing excess gas from said dough and sucking dough into said entry port for rapid dough flow.

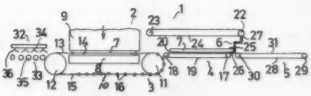
3,927,612

APPARATUS FOR CHARGING PANELS INTO A PRESS

Helmut A. Friz, and Dieter Grube, both of Stuttgart, Germany, assignors to Adolf Friz Gesellschaft mit beschrankter Haftung, Stuttgart, Germany

Filed Dec. 13, 1973, Ser. No. 424,447
Claims priority, application Germany, Dec. 15, 1972, 2261622
Int. Cl.² B30B *15/30*
U.S. Cl. 100—215 8 Claims

1. A charging device for feeding panels into a press having opposed pressing members for pressing a cover layer on the panel, said device comprising an endless first conveyor in the press having panel supporting members distributed along a portion only of the length thereof and having one position wherein the supporting members are outside the range of the pressing members, second conveyor means outside the press along which the panels move into the range of said pressing members while said first conveyor is operating to move said supporting members in the range of said pressing members in



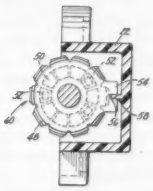
supporting relation to the panel, and a reciprocable holding member operable to engage the trailing end of a panel moving into the press and halt the panel in working position within the range of said pressing members while said first conveyor moves into said one position thereof and releases the panel for engagement with the lower pressing member.

3,927,613

IMPRINT WHEEL ASSEMBLY

Jack George Nantz, Euclid, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Feb. 4, 1974, Ser. No. 439,328
Int. Cl.² B41K *1/12*
U.S. Cl. 101—110 6 Claims



1. An imprint wheel assembly for use with a data recorder, said assembly comprising:

a frame;

a shaft mounted to said frame;

a plurality of imprint wheels each rotatably mounted to said shaft for selective rotation about the axis of said shaft to selected positions, said imprint wheels being axially disposed of each other and axially movable relative to said shaft;

means yieldably biasing said wheels axially toward each other; and

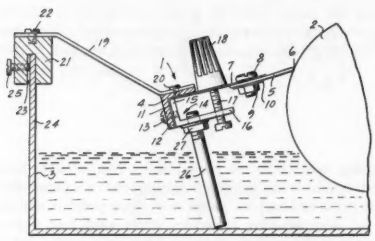
detent means associated with each of said wheels for axially detenting said wheels to maintain such in selected positions under the influence of said axial biasing means;

said detent means comprising a plurality of detent members each axially disposed adjacent a corresponding one of said plurality of wheels and normally retentively engaging said one wheel, each detent member separating the axially adjacent wheels from each other and including means for preventing rotation of the detent member about said shaft and allowing axial movement relative to said shaft against the influence of said biasing means, each said wheel and each adjacent said detent member including cooperating surfaces sloped at an angle to said axis and in sliding engagement while the associated wheel is rotated to a said selected position.

3,927,614
WATER CONTROL DEVICE FOR OFFSET LITHOGRAPHIC PRINTING PRESSES

Theodore C. Malek, 390 We Go Court, Deerfield, Ill. 60015

Filed May 2, 1974, Ser. No. 466,135
Int. Cl.[2] B41L 25/02; B41F 7/24
U.S. Cl. 101—148 8 Claims



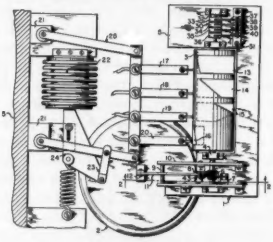
1. A control device for the water cylinder of an offset lithographic printing press, having a plate cylinder and a water cylinder from which water from a cooperable supply is to be transferred to the plate cylinder, comprising an elongated support structure having an upper leg and a lower leg connected by an intermediate portion of generally U-shape in transverse cross-section, adapted to be disposed laterally adjacent such a water cylinder at the side thereof exiting from such a supply, the upper leg of said U-shaped support structure being of less length, in transverse cross section, than the lower leg thereof, with the open end of said U-shaped configuration facing such cylinder, a plurality of resilient strip-like metallic elements, each having a corresponding end disposed in a common plane and mounted on the intermediate portion of said support structure, with such elements extending in generally parllel relation toward said cylinder but spaced therefrom, a plurality of cylinder-engaging members, each carried by a respective resilient element at the opposite free end thereof, said members being formed from a pliable rubber-like material and disposed in a row in substantially side-by-side relation and having their outer edges in substantially aligned relation for engagement with the surface of such a water cylinder substantially throughout its operative length, to effect a squeegee action with respect to water disposed on the face thereof, a manually actuatable screw for each resilient element and cooperable member, extending through the associated element and threaded into the lower leg of said support structure, each screw including a manually actuatable knob rigidly connected thereto, by means of which the screw may be rotated, each knob being adapted to apply pressure on the upper face of the associated resilient element for flexing the same to control the pressure of the associated resilient member on the surface of the cylinder and thereby control the amount of water thereafter retained on the cylinder and thus ultimately transferred therefrom to the plate cylinder of such a press.

3,927,615
PRESSURE-TIME RESPONSIVE ELECTRONIC DEVICE

Joseph F. Keithley, Cleveland Heights, Ohio, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 12, 1950, Ser. No. 184,506
Int. Cl.[2] F42B 22/26
U.S. Cl. 102—18 15 Claims

1. A pressure-time responsive integrating device operable in response to a negative pressure differential signal to integrate said signal under varying magnitude conditions through a predetermined time interval, which comprises pressure sensitive means operative in response to a change in negative pressure, an electrical circuit including a power source and a plurality of sequentially connected switch elements constructed and arranged to operate in sequential order in response to actuation by said pressure sensitive means, said circuit also including a gas tube having a starter anode therein and arranged to be fired after a predetermined pressure differential signal is detected by the pressure sensitive means and after closing of one or more of the switch elements of the circuit, said circuit also including a resistance-capacitance filter circuit therein, said filter circuit including a capacitor and a plurality of resistances of varying values with one each of said resistances connected through one of the plurality of

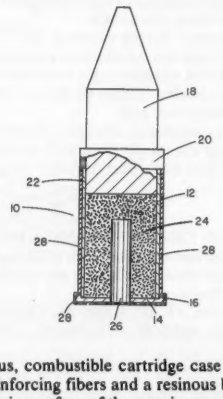


switches in a series relationship with the capacitor whereby upon closing of the switch elements by the pressure sensitive means, a current is caused to flow from said power source through a first resistance to produce a charge on the capacitor and in which upon closing of one or more additional switch elements the current flow is through the additional switch elements to a resistance of less value than said first resistance to thus produce capacitor charging at a higher rate, the capacitor being connected to the starting anode of the gas tube in a manner whereby the building up of sufficient charge on the capacitor will produce firing of the gas tube.

3,927,616
COMBUSTIBLE CARTRIDGE CASE

Sydney Axelrod, New York, N.Y., and Walter Brenner, Teaneck, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 23, 1974, Ser. No. 463,237
Int. Cl.[2] F42B 9/16, 5/18
U.S. Cl. 102—43 R 5 Claims



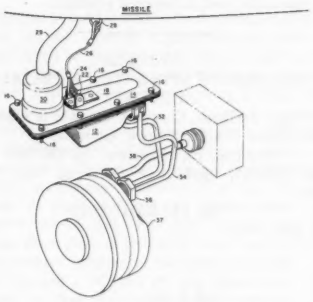
1. A porous, combustible cartridge case comprising nitrocellulose, reinforcing fibers and a resinous binder, wherein at least the exterior surface of the case is covered with a substantially water-impermeable, consumable coating consisting essentially of finely divided particles of a solid high energy explosive of the group consisting of cyclotrimethylenetrinitramine, cyclotetramethylenetetranitramine and pentaerythritol

tetranitrate, dispersed in a thermally depolymerizable, solid polymeric resin of the group consisting of alkyl methacrylate polymers, methacrylonitrile polymers and alpha methyl styrene polymers.

3,927,617
POST-LAUNCH DUAL PRESSURE SENSITIVE ARMING DEVICE

Warren R. Hoelzen, Ontario; Charles R. Hamilton, Riverside, and James E. Warnock, La Mirada, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 22, 1969, Ser. No. 795,771
Int. Cl.² F42C *9/00*
U.S. Cl. 102—82 **7 Claims**



1. In an aircraft launched guided missile fuze sensitive to a post launch environment for arming, the combination comprising:

a. arming mechanism means normally in an unarmed position and having an armed position,

b. pressure sensing means being exposed to the atmosphere after the launch of the missile for sensing at least two different dynamic ram air pressures,

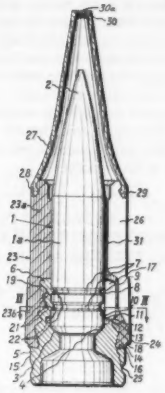
c. at least two pressure sensitive actuating means coupled to said arming mechanism means and to said pressure sensing means for actuating said arming mechanism means from the unarmed position to the armed position in response to a predetermined different in the level of said sensed dynamic ram air pressures.

3,927,618
SABOT PROJECTILE

Walter Engel, Dubendorf, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Division of Ser. No. 231,867, March 6, 1972, Pat. No. 3,837,057. This application Nov. 15, 1973, Ser. No. 416,208
Int. Cl.² F42B *13/16*
U.S. Cl. 102—93 **5 Claims**

1. A sabot projectile comprising a sabot rear part having a substantially sleeve-shaped extension, said sleeve-shaped extension being subdivided into a plurality of segments by slots uniformly distributed about the periphery of the sleeve-shaped extension, each segment being provided at its outside surface with a blindhole bore having a base surface by means of which there is formed a thin-walled zone at each segment, and a stamped recess provided at the base surface of each segment wherein opposite each such recess there is formed a radially inwardly directed projection, a projectile body mounted at the sabot rear part, said projectile body having a peripheral groove at its rear portion which extends into the sleeve-shaped

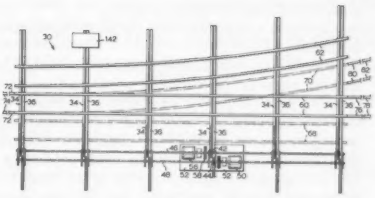


extension, said radially inwardly directed projections engaging with said peripheral groove of said projectile body.

3,927,619
DOUBLE TIERED CONVEYOR TRACK AND SAFETY SWITCH

Robert Auldom Bradley, 18 Ralston Ave., Toronto, Ontario, Canada (M4C 3L5)

Filed Nov. 15, 1974, Ser. No. 523,986
Claims priority, application Canada, Jan. 18, 1974, 190632
Int. Cl.² E01B *25/06*
U.S. Cl. 104—130 **7 Claims**



1. An elevated railway system comprising

a. main line track means,

b. branch line track means,

c. track switch means,

d. a first section of said main line extending from a first end of said track switch means, and a second section of said line extending from a second end of said track switch means, said branch line means extending from said second end of said track switch means, said main line and said branch line each having first track means for supporting and guiding a rail going vehicle and second track means for supporting and guiding a rail going vehicle and track support means for supporting said first and second track means in elevated planes wherein said second track is located directly below said first track,

e. said track switch means having first and second branch track means and first and second main track means,

f. first switch track support means for fixedly supporting said first branch track means and said first main line track means with respect to one another for transverse movement so as to selectively align said first track means of said main line track means of said switch means with said main line or to align said first track means of said first

branch track means of said switch means with said first section of said main line and said branch line means,

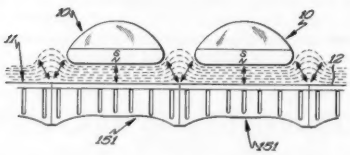
g. second switch track support means for fixedly supporting said second branch track means and said second main line track means with respect to one another for transverse movement so as to selectively align said second track means of said main line track means of said switch means with respect to said second main line track means or to align said second branch track means of said switch means with respect to said first section of said main line and said first section of said branch line and means for moving said first and second transverse support means independently of one another.

3,927,620

MAGNETIC PROPULSION SYSTEM

Thomas J. Clapham, 2823 18th Ave. N., Minneapolis, Minn. 55411

Filed Dec. 3, 1973, Ser. No. 421,393
Int. Cl.² B61B *13/08*
U.S. Cl. 104—148 LM **8 Claims**



1. A magnetic propulsion system comprising:

a vehicle,

a plurality of field-producing elements on said vehicle being operable when energized to produce magnetic fields,

signal-producing means on the vehicle being operable to produce ultrahigh-frequency signals,

means defining a roadway having a generally planar upper surface,

a plurality of field-producing thrust and levitation elements on said roadway adjacent the upper surface thereof, a plurality of field-producing partition elements on said roadway adjacent the upper surface thereof, signal receiving means on the roadway adapted to receive ultrahigh frequency signals from the signal-producing means when the latter is in close proximity to the signal receiving means are thereby energized the field-producing elements on the roadway, the magnetic fields produced by the field-producing elements on the roadway interacting with the magnetic fields produced by the thrust and levitation field-producing elements on the vehicle to produce levitation of the vehicle above the surface of the roadway, and cause thrust of the vehicle longitudinally with respect to the roadway, said partition field-producing elements when energized, producing repelling fields whose profiles maintain the vehicle in a predetermined generally longitudinal path of travel.

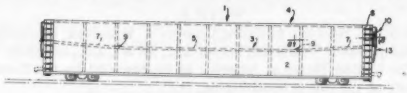
3,927,621

RAILWAY CAR HINGE-DECK LOCK

Anthony John Skeltis, Novi; Jaroslaw Joseph Rostafinski, Ferndale, and Chandrakant Dhanjibhai Ravani, Farmington, all of Mich., assignors to Portec, Inc., Oak Brook, Ill.

Filed Dec. 20, 1974, Ser. No. 536,621
Int. Cl.² B61D *3/02*
U.S. Cl. 105—368 R **11 Claims**

1. A multi-level auto rack car includes, a middle deck disposed between two vertical side walls, said middle deck including at least one end hinge deck section having a forward edge juxtaposed one end of the car and vertically displaceable between elevated and lowered positions, a locking mechanism disposed at the ends of said side walls adjacent said hinge deck forward edge, support means fixed relative said side walls and upon which said hinge deck section is disposed when in the lowered position, said locking mechanism including a lock rod having one end attached to said car, said rod having a main



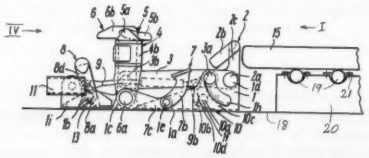
body overlying said deck section forward edge, locking means on said rod main body having alternate portions selectively engageable with said deck section to retain said deck section in either the elevated or lowered positions, and spring means between said deck section and car normally biasing said deck section upwardly from its lowered position.

3,927,622

FREIGHT LASHING APPARATUS, ESPECIALLY FOR AIRCRAFT

Werner Voigt, Weilheim, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Dec. 16, 1974, Ser. No. 533,303
Claims priority, application Germany, Dec. 22, 1973, 2364270
Int. Cl.² B61D *45/00*
U.S. Cl. 105—463 **12 Claims**

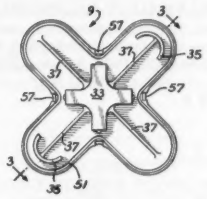


1. A freight lashing apparatus for securing freight to a loading floor, comprising a frame structure, a first tilting axis (**2***a*) held in said frame structure, bell crank lever means tiltably supported on said first tilting axis and having normally vertically extending arm means and normally horizontally extending arm means, roll over bail means (**2**) held by said normally vertically extending arm means, said roll over bail means having two slanted contact surfaces extending normally toward said horizontally extending arm means, push rod means, bar means (**3***a*) connecting said normally horizontally extending arm means of said bell crank lever means to one end of said push rod means (**3**), said conneting bar means having free ends, guide slots in said frame structure, each of said free ends of said connecting bar means (**3***a*) riding in a respective one of said guide slots, a freight locking mechanism (**4**,**6**), a second tilting axis (**6***a*) also held in said frame structure and tiltably supporting said freight locking mechanism, means journaling the other end of said push rod means (**3**) to said freight locking mechanism above said second tilting axis, and unlocking means (**8**) operatively connected to said locking means, said roll over bail means being responsive to a forward and lateral freight movement and said unlocking means (**8**) being responsive to a reverse freight movement, whereby said bell crank lever means with the roll over bail means and the locking mechanism are tiltable into a retracted, lowered position below said loading floor in response to freight movement in any direction.

3,927,623
LASHING SOCKET COVER

Norman O. Caron, Braintree, Mass., assignor to General Dynamics Corporation, St. Louis, Mo.

Filed June 17, 1974, Ser. No. 479,661
Int. Cl.[3] A62B *35/00*
U.S. Cl. 105—475 3 Claims



1. A removable cover for a shipboard lashing socket having a flush deck portion wherein a generally cruciform access opening is provided having four lobes the outer ends of which are arcuate and having a bottom portion of generally bowl-like shape which is attached along its periphery to said deck portion, which cover comprises

a plate portion of dimension greater than said cruciform access opening which totally covers said opening,

the underside of said plate having a pair of depending locators which are arcuate in horizontal section and are proportioned to fit just within the arcuate outer ends of opposite lobes of said cruciform opening and thereby align said plate portion to totally cover said opening and prevent relative rotation of the installed cover,

said cover having a housing portion depending from the underside of said plate portion and centrally located thereupon,

said housing having at least two opposed, horizontal bores, each of said bores containing a rotatable ball detent and retainer means limiting the distance said ball detent can protrude from said bore,

seat means in each said bore in contact with a rear portion of each ball detent, and

spring means biasing said seat and ball detent to the protruding position,

said bores being located in said housing so that said ball detents in an installed cover latchingly engage the lower edge of the flush deck portion of the socket in a region thereof between adjacent lobes of the cruciform access opening,

whereby said removable cover is securely latched within said shipboard lashing socket and resists inadvertent removal.

3,927,624
KNOCK DOWN PALLET

Kenneth E. Hewson, 626 Colony Drive, Troy, Mich. 48084

Filed Jan. 28, 1974, Ser. No. 436,876
Int. Cl.[2] B65D *19/26*
U.S. Cl. 108—56 1 Claim

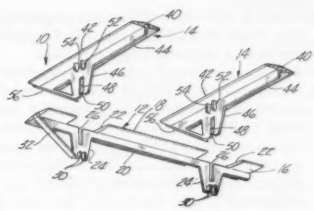
1. A pallet comprising:

a plurality of first beam elements, each fabricated from a plastic material and of a selected length,

each of said first beam elements having a support surface and outwardly projecting support posts at selected spaced locations along the longitudinal length of each of said first beam elements said support surface having notches therein at positions located above each of said support posts;

a plurality of second beam elements, each fabricated from a plastic material and of a selected length, each of said second beam elements having a support surface and outwardly projecting support posts at selected spaced locations along the longitudinal length of each of said second beam elements, said first and second beam element support posts having mating slotted portions such that the support posts of said first beam elements engage the support posts of said second beam elements;

snap lock means carried at the projecting ends of said support posts of said first and second beam elements for interlocking said first and second beam element support posts;



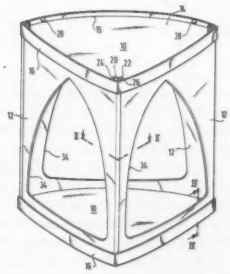
first vertical flange means integrally formed on said first beam elements and extending laterally of said first beam element support posts to engage said second beam element support posts; and

second vertical flange means integrally formed on said second beam elements and extending laterally of said second beam element support posts to engage said first beam element support posts, said first and second vertical flange means respectively restraining said second and first beam element support posts from lateral movement with respect to one another.

3,927,625
SET OF PARTS FOR A DISPLAY RACK

Franz Josef Lang, Kelkheim, Germany, assignor to Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung, Kelkheim, Germany

Continuation-in-part of Ser. No. 298,955, Oct. 19, 1972, Pat. No. 3,834,324. This application July 15, 1974, Ser. No. 488,893
Claims priority, application Germany, Oct. 27, 1971, 2153603The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.[2] A47B *47/04*
U.S. Cl. 108—91 10 Claims



1. A rack assembly comprising:

a. a plurality of identical base plate members having each a top surface, a bottom surface, and a circumferential edge elongated in a direction parallel to said surfaces and connecting said surfaces;

b. wall means defining a plurality of receptacles circumferentially spaced along said edge on each of said surfaces,

1. said receptacles projecting from said surfaces in opposite directions transverse to said surfaces respectively,
2. each receptacle including a first wall member and a second wall member,
3. respective substantially parallel faces of said wall members defining therebetween a slot open in a direction away from the associated base plate member and in a circumferential direction,
4. the length of said slot parallel to said surfaces being substantially greater than the width thereof between said faces,
5. a part of said first wall member projecting beyond said face of the second wall member longitudinally of said slot in said circumferential direction;

c. a plurality of identical supporting members,
1. each supporting member having two terminal portions spaced in a predetermined direction and shaped for being conformingly received in respective slots of two of said receptacles on respective base plate members in a position in which a part of each terminal portion projects from the receiving slot in the direction of elongation of said slot beyond the face of the second wall member defining said slot, and said predetermined direction is transverse to said surfaces; and

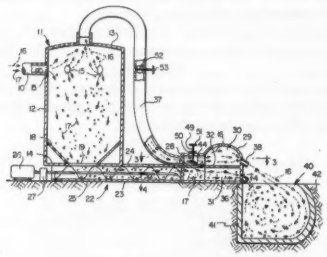
d. releasably interengageable locking means on the projecting part of the first wall member of each receptacle and on the projecting parts of the terminal portions of each supporting member for retaining said terminal portions in said two receptacles.

3,927,626

INCINERATOR SYSTEM FOR DRY WASTE MATERIAL

Nicholas J. Fokakis, 100 Mandelay Drive, Hattiesburg, Miss. 39401, and Paul S. Woods, 141 Princeton St., Jackson, Miss. 39203

Filed Jan. 31, 1975, Ser. No. 546,166
Int. Cl.² F23G 7/00
U.S. Cl. 110—18 R **5 Claims**



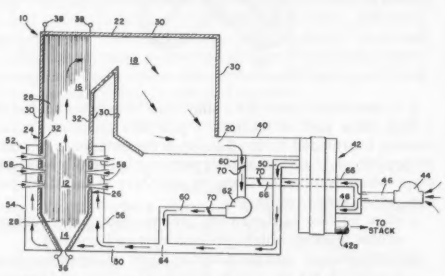
1. Apparatus for burning dry waste material within an open pit comprising a collector-separator, means for introducing dry waste material and air under pressure into said collector-separator, the dry waste material and the air being substantially separated from each other within said collector-separator, distributor means spaced from said collector-separator, conveyor means connecting the lower portion of said collector-separator with said distributor means for moving dry waste material from said collector-separator to said distributor means, first nozzle means on said distributor means for discharging waste material from the distributor means into the open pit, air duct means connecting the upper portion of said collector-separator with said distributor means for moving air under pressure from said collector-separator to said distributor means, second nozzle means on said distributor means for discharging air at high velocity from said distributor means into the open pit, said second nozzle means overlying said first nozzle means and extending substantially the full length of the pit, whereby the air discharged from said distributor means through said second nozzle means forms a curtain of air above the waste material in the pit and is diverted into the waste material to support combustion when the material is ignited as well as to substantially prevent the discharge of pollutants into the atmosphere.

3,927,627

STEAM GENERATING SYSTEM AND METHOD UTILIZING EXHAUST GAS RECIRCULATION

Frederick Milton Brunn, Sparta, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Nov. 29, 1974, Ser. No. 528,364
Int. Cl.² F23J 5/02
U.S. Cl. 110—49 R **12 Claims**



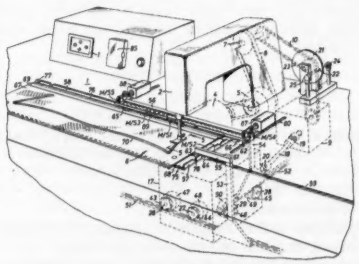
1. A steam generating system comprising a furnace, means for passing at least a portion of the exhaust gases from the outlet section of said furnace back into the combustion section of said furnace, said means including a duct connecting said sections and a fan disposed in said duct, means for passing air at ambient temperature directly into said duct upstream of said fan for cooling said exhaust gases before they enter said fan, and means for passing preheated air into said duct downstream of said fan for mixing with said cooled exhaust gases before they are passed to said combustion section.

3,927,628

PROFILE STITCHING MACHINES

George William Palmer, Sudbury, England, assignor to Stateside Machinery Co., London, England

Filed Feb. 21, 1974, Ser. No. 444,682
Int. Cl.² D05B 21/00
U.S. Cl. 112—121.12 **17 Claims**



1. A profile stitching apparatus including a power driven sewing machine having a needle, a stitching tracker plate having a slotted profile arranged to be moved with its slot in register with said needle of said sewing machine to sew along said profile; and first and second transmission means arranged to couple said plate respectively to a first and to a second drive means to allow said plate to move relatively to said needle of said sewing machine, said first transmission means including

a first gear assembly having a first pair of contra-rotatable pinions each of which engages a first idler gear meshed with a first rack means which, in turn, is operatively connected to a first carriage member and arranged to engage guide means arranged along one longitudinal edge of said tracker plate to permit said tracker plate to be moved in a direction transversely of said first longitudinal edge, and said second transmission means including a second gear assembly having a second pair of contra-rotating pinions each of which engages a second idle gear meshed with a second rack means which, in turn, is operatively connected to a second carriage member arranged to engage further guide means arranged along another lateral edge of said tracker plate to permit said tracker plate to be moved in a direction different from the first mentioned direction.

3,927,629

SEWING MACHINE PRESSER FOOT AND FEED DOG LIFTING MECHANISM

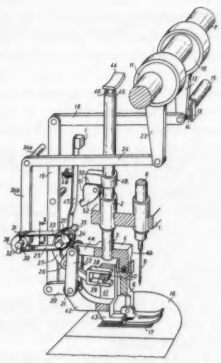
Kurt Vollmar, Weilerbach, Germany, assignor to Pfaff Industriemaschinen GmbH, Germany

Filed Sept. 18, 1974, Ser. No. 507,214

Claims priority, application Germany, Oct. 20, 1973, 2352731

Int. Cl.² D05B *27/04*

U.S. Cl. 112—212 **10 Claims**



1. A sewing machine, comprising a presser foot engageable with a workpiece during the feeding thereof, spring means bising said presser foot toward engagement with the workpiece, feed dog means including an upper feed dog, a lift member connected to said upper feed dog and said presser foot and being movable to lift at least said upper feed dog therewith, a lifting mechanism including a movable arm, said arm and said lift member having roller means thereon, and and endless belt of constant length engageable over said roller means of said arm and said lift member and being movable in one direction of motion of said lift member to move said arm therewith to raise said upper feed dog, and being movable upon the movement of said lift member in another direction to loosen between said roller means of said lift member and said roller means of said arm.

3,927,630

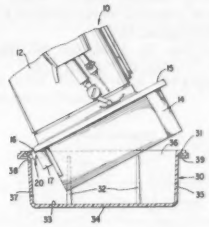
SEWING MACHINE ATTACHMENT TO CARRYING CASE BASE

Francois Rene Andre Saintier, Bonnieres-sur-Seine, France, assignor to The Singer Company, New York, N.Y.

Filed Mar. 10, 1975, Ser. No. 557,150

Int. Cl.² D05B *75/00*

U.S. Cl. 112—217.1 **2 Claims**



1. In combination, a sewing machine having a bed with a work supporting surface, said bed having at least one hinge hole; and a base receiving said bed, said base having a top surface substantially on a level with said sewing machine work-supporting surface; and means retaining said sewing machine to said base, said retaining means comprising:

a. At least one substantially rigid insert fixable in said at least one hinge hole and extending therefrom;

b. At least one aperture in said base opposite to and substantially aligned with said at least one hinge hole, said aperture receiving said insert; and

c. A latch means disposed substantially diametrically opposite said at least one aperture for retaining, with said insert in said aperture, said sewing machine work-supporting bed to said base.

3,927,631

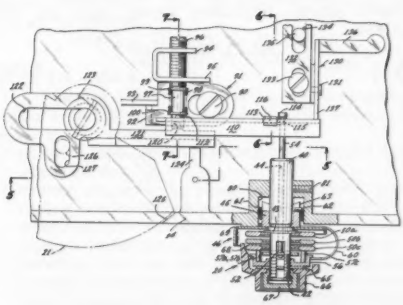
THREAD TENSIONER WITH IMPROVED YAWN MECHANISM

Ludwig John Kuhar, Clark, N.J., assignor to The Singer Company, New York, N.Y.

Filed Mar. 25, 1975, Ser. No. 561,749

Int. Cl.² D05B *47/02*

U.S. Cl. 112—254 **5 Claims**



1. A thread tension device for sewing machines comprising an arbor, at least one pair of thread engaging tension discs mounted on said arbor and between which needle thread is adapted to pass, one of said tension discs being formed of a non-magnetic material and a second of said tension discs being formed of magnetic material, spring means for biasing said tension discs together thereby to apply tension to the

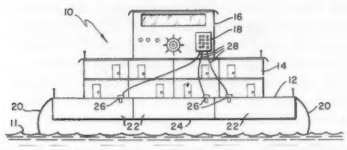
thread passing between them, means for releasing said spring means, and magnet means disposed in relation to said tension discs to cause said tension discs to separate upon actuation of the spring release means.

3,927,632

METHOD OF DETERMINING WATERTIGHT INTEGRITY IN HOVERCRAFT

Michael R. Terry, Mercer Island, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1974, Ser. No. 446,062
Int. Cl.² B63B *1/38*
U.S. Cl. 114—67 A **1 Claim**



1. A method of determining the water-tight integrity of a hovercraft riding on a cushion of air over a surface of water and having a static differential pressure in a compartmented floatation hull, comprising the steps of:

operating a hovercraft on-cushion by providing a volume of air under pressure between a floatation hull and a surface of water;

detecting an operating pressure differential of a compartment in said hull from atmospheric pressure;

comparing said operating pressure differential to said static differential pressure; and

electrically indicating at a convenient place on said hovercraft said operating pressure differential to static pressure differential comparison;

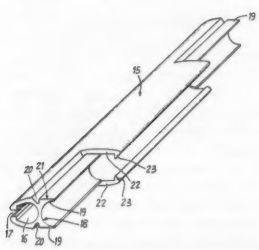
whereby a violation of watertight integrity is indicated by cushion air pressure entering a compartment and increasing the pressure differential to above atmospheric.

3,927,633

SHEATH FOR A STAYSAIL OF A BOAT

Bernard Bernard, 10, rue Saint Exupery, 43200 Roanne, France

Filed Sept. 10, 1974, Ser. No. 504,696
Claims priority, application France, Sept. 18, 1973, 73.33850
Int. Cl.² B63H *9/08*
U.S. Cl. 114—105 **8 Claims**



1. A sheath for a staysail, said sheath comprising

a plurality of identical sections each having end portions, a center portion between the end portions, and a central plane, each said section comprising

means defining a channel provided with a slot and forming a boltrope tunnel, said channel being located on one side of the section, and

clamp means on the opposite side of the section, said clamp means including

first arms of a first length at the end portion of the section, and

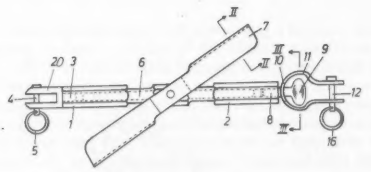
second arms of a second length at the center portion of the section, the second arms being longer than the first arms and being located at a greater distance from said central plane of the section, each said section mating with an adjacent section with the respective second arms of each section engaging on the first arms of the other section, said mating sections providing a passage for the stay and two boltrope tunnels parallel with the passage, with the passage being located between the tunnels and the axis of the passage and the tunnels lying in a common plane.

3,927,634

PIVOTALLY OPERATING SAIL AND LINE HOLDING AND TIGHTENING MEANS

Werner Stoerring, Ringstr. 20, 5604 Neviges, Germany

Filed Mar. 26, 1974, Ser. No. 454,840
Claims priority, application Germany, Dec. 22, 1973, 2364362
Int. Cl.² B63H *9/04*
U.S. Cl. 114—108 **1 Claim**



1. Pivotally operating sail and line holding and tightening means for shrouds on a boat comprising:

two outside lying connecting members;

two tensioned adapter sleeves, each sleeve bearing each time on one of said outside lying connecting members and the inside ends of each of said sleeves threadedly receiving or accomodating a bolt means;

a bolt means provided for the sleeves;

one half of the bolt means being provided with a right-hand thread and the other half of the bolt means being provided with a left-hand thread;

a centrally pivoted open ended double lever having a longitudinal middle in which is located the central pivot of the double lever and which is mounted on the middle of the bolt means;

The open ends of said centrally pivoted double lever each being generally U-shaped in its cross section and the double lever being mounted after swing-in to wrap the lever around the adapter sleeves so that it tightly presses to engage both edges of said two adapter sleeves;

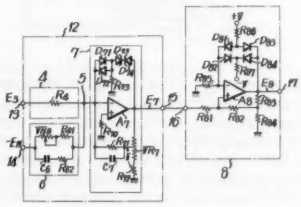
said open ends of said levers being developed with flat edges each opening in an opposite direction to the other thereby securing the adapter sleeves against twisting;

at least one connecting member consisting of a U-shaped strip and a generally spherical peg in the deepest part of the U, which is pivotally connected to its corresponding adapter sleeve;

said peg being rigidly attached to the adapter sleeve on one side of said connecting member and said U-shaped bottom having a clearance for said peg to facilitate swing-in by an encircling action to hold the adapter sleeve and to also hold the shroud edges fast while securing these edges against twisting action;

means to attach and to release the bent U-shaped legs;
a stirrup-like member fixed at both ends of the stirrup to the hull of the boat for holding a shroud; said at least one connecting member consisting of a U-shaped strip being slidingly connected to said stirrup-like member for holding the shroud.

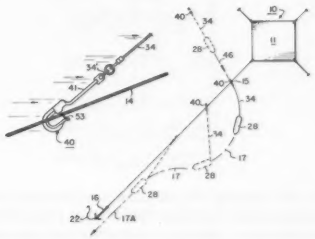
3,927,635
MARINE AUTOPILOT SYSTEM
Isao Masuzawa, Kuki; Tsuneo Awano, and Kazutoshi Onishi, both of Yokohama, all of Japan, assignors to Kabushiki Kaisha Tokyo Keiki, Japan
Continuation of Ser. No. 376,344, July 5, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,854
Claims priority, application Japan, July 10, 1972, 47-68929
Int. Cl.² B63H 25/04; G05B 11/01
U.S. Cl. 114—144 E 2 Claims



1. A marine autopilot system comprising, a first transducer for producing an electrical signal corresponding to the deviation of a ship's heading from a set course; a first means for producing an electrical signal corresponding to a rudder order receiving the output of said first transducer; a servo loop including a servo amplifier and a relay-like operation device for producing a rudder command receiving the electrical signal from said first means; a means provided in said relay-like operation device for making its off-voltage substantially zero and its on-voltage substantially equal to its hysteresis voltage, and an adjusting means provided in said servo amplifier for adjusting its gain, whereby the voltage of said signal applied to said servo loop which makes said relay-like operation device turn on, can be changed in accordance with a gain determined by said adjusting means and the voltage of said signal applied to said servo loop, which makes said relay-like operation device turn off, is kept at substantially zero irrespective of said adjusted gain, said relay-like operation device including a first operational amplifier and a circuit connected between the negative input terminal and the output terminal of said first operational amplifier for achieving relay-like operation, said means provided in said relay-like operation device being provided in a positive feedback circuit of said first operational amplifier for making off-voltage substantially zero, said servo amplifier including a second operational amplifier and said adjusting means connected in a negative feedback circuit of said second operational amplifier, said negative feedback circuit including a variable resistor and a feedback resistor and said variable resistor serving as a weather adjustment device.

3,927,636
METHOD OF RETRIEVING ANCHORS
Mark A. Childers, and Enoch L. Dawkins, both of New Orleans, La., assignors to Ocean Drilling & Exploration Company, New Orleans, La.
Filed Sept. 26, 1974, Ser. No. 509,573
Int. Cl.² B63B 21/26
U.S. Cl. 114—206 R 2 Claims

1. The method of locating and retrieving an anchor, buried in the seabed and being attached to the bottom end of an inclined mooring line whose upper end is attached to a submerged member of a structure floating in a body of water, by utilizing a surface ship and equipment, said surface ship being on the surface of the body of the water and having a service line, and said equipment including a remote-operated catch hook on the service line, and a control unit on said ship for remotely controlling the opening of the catch on said hook; said method being characterized by utilizing the following steps:
moving the ship near the structure,
submerging the hook and a portion of the service line into the body of water;
towing the submerged hook in a direction intersecting the mooring line until the mooring line forcibly opens the catch and becomes hooked;



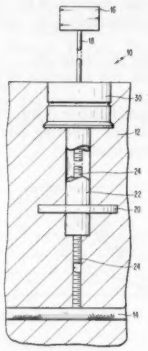
gradually swerving the service line in the direction of the mooring line toward the buried anchor;
progressively lowering the service line as the ship moves toward the anchor allowing the hook to slide down on the mooring line;
uplifting the service line to retrieve the anchor from the seabottom;
progressively taking in the mooring line into the structure; progressively taking in the service line into the ship, while supporting the anchor with the service line;
moving the ship toward the structure;
remotely releasing the hook's catch by actuating said control unit; and
bolstering the anchor onto the structure.

3,927,637
POSITIVE SUB-SURFACE UTILITY LINE AND THE LIKE INDICATOR
Michael Sammaritano, 1808 Vails Gate Heights Drive, Newburgh, N.Y. 12550
Filed Sept. 14, 1973, Ser. No. 397,607
Int. Cl.² G01D 21/00
U.S. Cl. 116—114 R 1 Claim

1. A device for providing at ground surface the location and depth of an underground conduit as well as the direction said conduit extends comprising:
a measuring tape adapted to be fastened at one end thereof to said conduit;
a housing adapted to be placed adjacent to said ground surface, said housing having a recessed portion at the top thereof and an orifice extending from the bottom of said recessed portion through the bottom of said housing with the other end of said tape extending through said orifice; a container for fitting snugly within said recess, said container being generally dish shaped with an open top so as to be able to contain an envelope for holding information concerning said conduit;
a number of holes in the bottom of said container arranged in a circle and an equal number of corresponding holes at the bottom of said recess in said housing so that one or more pins can be placed in holes at the bottom of said recess to extend upward into corresponding holes in said container after said container has been oriented to a

desirable position with respect to said housing and placed down snugly within said recess and;

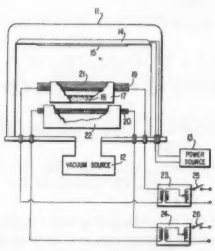
a cap serving as a closure for the open top of said container; whereby, when said housing has been placed adjacent to said ground surface, indicia on said container can indicate the direction of said conduit when said container has been properly oriented with respect to said housing and said container can be removed so that the other end of said measuring tape is visible to indicate the depth of said conduit when said one end of said measuring tape is fastened to said conduit.



3,927,638
VACUUM EVAPORATION PLATING APPARATUS

Fukumatsu Sakaue, Minami-ashigara, Japan, assignor to Fugi Xerox Co., Ltd., Tokyo, Japan

Filed Apr. 11, 1974, Ser. No. 459,955
Claims priority, application Japan, June 4, 1973, 48-61799
Int. Cl.² B05C 19/02
U.S. Cl. 118—49.1 8 Claims



1. A vacuum evaporation plating apparatus for controlling fractional distillation of respective components of a photosensitive material, said apparatus comprising

a single container for said photosensitive material;

a first heating means for heating with radiation the evaporating surface of the photosensitive material, said first heating means being disposed above said material such that said electromagnetic radiations impinge directly on said evaporating surface;

a second heating means for heating the photosensitive material from either the interior or bottom thereof;

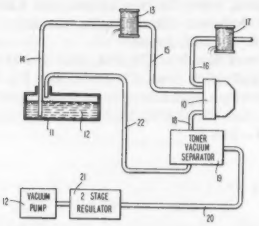
means for receiving the vapors of the heated photosensitive material for forming a photosensitive film; and

said first and second heating means controlling the deposition of said components to control the relative percentages of said components in the photosensitive film deposit through the thickness thereof.

3,927,639
APPARATUS FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE ON AN ELECTROPHOTOGRAPHIC FILM

John D. Plumadore, Westfield, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Filed Apr. 8, 1974, Ser. No. 459,194
Int. Cl.² B05B 5/02
U.S. Cl. 118—637 6 Claims



1. In an apparatus for developing an electrostatic latent image on an electrophotographic film, comprising:

a developing chamber forming a passageway through which electrostatically charged toner particles in a carrier liquid are conducted to contact the film, the chamber having an opening bordered by a mask against which the film is placed to form a seal, an inlet through which toner particles and air enter the chamber, and an outlet through which toner particles and air leave the chamber;

toner supply means for providing liquid toner to be passed through the chamber;

toner flow control means for permitting a predetermined quantity of liquid toner to flow through the developing chamber at predetermined times;

air supply means for supplying drying air to the inlet of the chamber; and

vacuum means connected to the outlet of the chamber for drawing the liquid toner and the air through the chamber, the vacuum means creating sub-atmospheric pressure within the chamber to prevent leakage of liquid toner from the chamber around the film;

the improvement in the apparatus wherein the toner flow control means and the air supply means are provided by:

a conduit leading from the toner supply means to the inlet of the developing chamber;

a toner valve through which the conduit passes;

an orifice connected to the conduit and positioned in the inlet of the developing chamber, the orifice sized to permit liquid toner to be drawn by the vacuum means into the developing chamber only when the toner valve is opened;

an air valve through which passes the drying air which enters the developing chamber through the inlet; and

means for opening and closing alternately the toner valve and the air valve for predetermined periods of time.

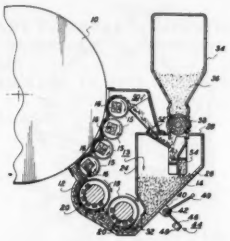
3,927,640
DEVELOPER SHUT-OFF APPARATUS

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 29, 1974, Ser. No. 464,862
Int. Cl.² G03G 15/08
U.S. Cl. 118—637 3 Claims

1. In a development system: A surface capable of having a developable image thereon, a developer housing including a developer sump, said sump having ferromagnetic developer therein, magnetic means located within said housing for presenting said developer to said surface, a developer outlet at the lowermost portion of said sump, said developer flowing through said outlet to said means for presenting said developer

to said surface, and magnetic gate means located entirely exterior said housing for selectively either magnetically blocking the entire flow of developer through said outlet when in a closed position or for allowing flow of developer through said outlet when in an open position, said magnetic gate means comprising a member having permanent magnet means secured thereto at one end and pivotally mounted to said housing at the other end for pivotal movement between said open and closed positions, and means for pivoting said member in one direction to move said permanent magnet means into said closed position adjacent said outlet to block the entire flow of developer through said outlet and for pivoting said member in the opposite direction to move said magnet away from said outlet to said open position to allow flow of developer through said outlet.

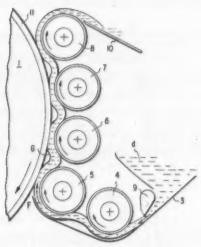


3,927,641

DEVELOPING MECHANISM USING MAGNETIC BRUSH

Kenichi Handa, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 10, 1974, Ser. No. 468,974
Claims priority, application Japan, May 10, 1973, 48-51199
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **3 Claims**



1. In a magnetic brush type developing mechanism having at least two developing magnetic brush rolls, said developing mechanism developing a latent image on a moving recording material with magnetic toner, the improvement comprising means for applying to a first magnetic brush roll encountered by said latent image a first potential, the absolute value of which is substantially greater than the absolute value of the background potential of said latent image and means for applying to a second magnetic brush roll immediately adjacent to said first roll and encountered by said latent image prior to said first roll a second potential, the absolute value of which is less than said absolute value of the background potential

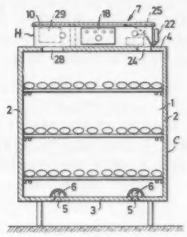
whereby development of the image portion of said latent image is enhanced due to the large potential difference between the potential of said image portion and said second potential while background fogging is lessened due to the large potential difference between said first potential and said background potential which attracts the magnetic toner from the space between said first and second magnetic rolls adjacent the recording material.

3,927,642

PROCESS AND APPARATUS FOR GASSING BROODING EGGS

Gerd Levin, Ernst-August Str. 13A, 2 Hamburg 54, Germany

Filed June 17, 1974, Ser. No. 479,778
Int. Cl.² A01K *49/00*
U.S. Cl. 119—1 **7 Claims**



1. A process for freshly laid gassing brooding eggs in a gassing cabinet by means of formaldehyde, consisting in the following procedural steps:

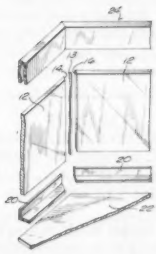
a. heating the gassing cabinet,
b. introducing the freshly laid brooding eggs to be gassed,
c. evaporating crystalline formaldehyde and water into air,
d. circulating the gas mixture in the gassing cabinet containing the brooding eggs, and
e. removing the gas mixture from the gassing cabinet.

3,927,643

AQUARIUM

Gerald R. Ritzow, 6300 Parkview Road, Greendale, Wis. 53129, and Roger C. Ritzow, S53 W23581 Big Bend Road, Waukesha, Wis. 53186

Filed July 31, 1974, Ser. No. 493,257
Int. Cl.² A01K *64/00*
U.S. Cl. 119—5 **5 Claims**



1. A container comprising:

a plurality of glass side panels arranged in a hexagonal shape, said glass panels fastened together at the edges with a mitered joint using an adhesive applied to the adjacent surfaces of said panel edges;

a bottom hexagonal panel positioned adjacent the bottom edges of said side panels with the bottom edges of said side panels resting on the top peripheral edge surface of said bottom panel and with the areas of contact having an adhesive applied thereto;

a plurality of bottom molding members fastened to the bottom panel and side panels at the joint therebetween, said bottom molding members having an angle shape with one leg thereof adhered to the bottom panel by an adhesive and with the other leg thereof adhered to a side panel by an adhesive; and

a single piece top molding strip fastened to the top edges of said side panels, said top molding strip being in the form of a single length of channel shaped material having a plurality of spaced notches in the sides thereof so that said top molding member can be folded into a hexagonal shape for installation on the top of the container, when so folded said notches will be closed to provide a molding having a continuous smooth surface on all sides of the molding member, said top molding member being held firmly in place on the container by an adhesive.

3,927,644

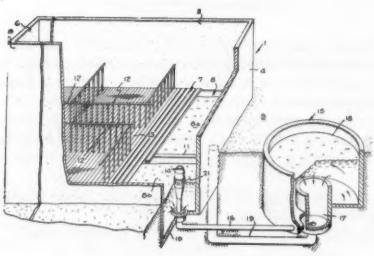
ANIMAL WASTE TREATMENT SYSTEM

Joel L. Nafziger, R.R. 1, Hopedale, Ill. 61747

Filed Jan. 3, 1974, Ser. No. 430,475

Int. Cl.² A01K *1/00*

U.S. Cl. 119—16 **10 Claims**



6. A waste treatment system for use in conjunction with a farm animal maintenance building in which animals are maintained on a floor, comprising the combination of a ditch disposed beneath the floor and operative to contain a slurry for the removal and disposal of animal waste, a trap having a bottom and wall means extending upwardly from the bottom to a selected level, means for introducing slurry from the ditch into the trap, a return sump positioned in the trap below the selected level, and means for returning slurry from the sump to the ditch whereby the slurry is recirculated from the ditch to the trap and returned to the ditch, said return sump including a trap for deposited solids so that a slurry substantially free of foam and solid materials is returned to the ditch.

3,927,645

SELECTIVE BIRD FEEDER

David E. Varner, 5302 Duvall Drive, Washington, D.C. 20016

Filed Mar. 27, 1975, Ser. No. 562,690

Int. Cl.² A01K *5/00*

U.S. Cl. 119—51 R **10 Claims**

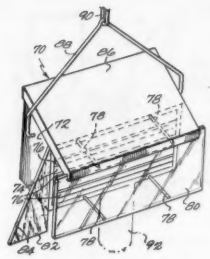
1. A selective bird feeder in which bird food is accessible to birds capable of clinging to a rough surface having a substantial angle from the horizontal but generally inaccessible to others, comprising:

means defining an enclosure for holding bird food;

at least a portion of the sides of said enclosure being of relatively open construction for enabling a bird to have access therethrough to bird food within said enclosure, the remainder of said enclosure-defining means being constructed to prevent such access therethrough;

shield means mounted exteriorly of said sides portion in position to prevent a bird from flying directly thereto, said shield means having at least a marginal edge portion disposed in generally coextensive spaced relation with said sides portion, the space between said shield means marginal edge portion and said sides portion being sufficient to permit a bird to enter therebetween by clinging movement but insufficient to permit a bird to fly directly thereinto and light therewithin, and

means defining a rough surface, substantially uninterrupted throughout its extent and having a substantial angle from



the horizontal, supported adjacent to said sides portion but uncovered by said shield means, said surface-defining means being constructed and positioned to enable a bird capable of substantially clinging to said surface to light thereon, cling thereto, and clingingly move therealong toward said sides portion for access through the latter to bird food within said enclosure but not to enable perching birds to light and find support thereon.

3,927,646

VAPOR GENERATOR

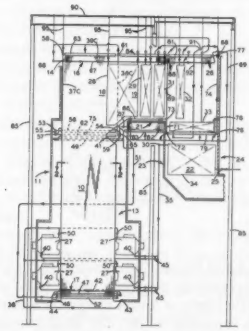
Harold J. Dungey, Barberton, and Arthur M. Frendberg, Akron, both of Ohio, assignors to Babcock & Wilcox Company, New York, N.Y.

Continuation of Ser. No. 447,699, April 13, 1965, abandoned.

This application June 14, 1974, Ser. No. 479,588

Int. Cl.² F22B *29/06, 37/24*

U.S. Cl. 122—6 A **9 Claims**



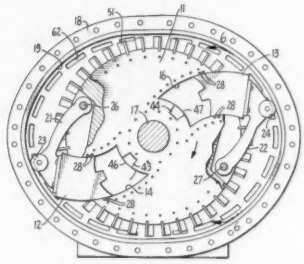
1. In a fluid heating unit, walls forming a furnace for flow of heating gases, means supplying high temperature heating gases to said furnace, one of said walls including a first group of upwardly extending fluid heating tubes forming a lower portion of said one wall and arranged for parallel flow of fluid therethrough, a second group of upwardly extending fluid heating tubes forming an upper portion of said one wall and arranged for parallel flow of fluid therethrough, means connecting the second group of tubes for series flow of fluid from the first group of tubes, means supplying fluid in parallel flow relation to the first group of tubes, said first and second groups of tubes being constructed and arranged to provide flow of fluid in the furnace only in an upward direction, some of the

tubes of the second group having lower portions interlaced with upper portions of some of the tubes of the first group, means for supporting said one wall including means rigidly uniting said interlaced tube portions of the first and second groups of tubes and transmitting the load of the first group of tubes to the second group of tubes, and means for top supporting the second group of tubes.

3,927,647
ROTARY INTERNAL COMBUSTION ENGINE

William A. Blackwood, 295 Polaris Ave., Mountain View, Calif. 94040

Filed Aug. 16, 1973, Ser. No. 388,985
Int. Cl.² F02B *57/00, 57/04*
U.S. Cl. 123—43 C **38 Claims**



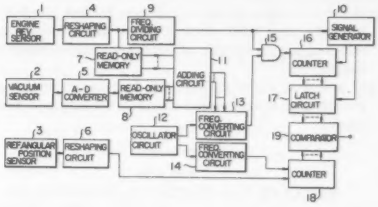
1. A rotary engine for two-cycle operation comprising,
a housing formed to provide an oblong inner cam surface,
a rotor carried for relative rotation in said housing,
walls in said rotor defining at least one arcuate combustion chamber,
a correspondingly arcuate piston mounted for curvilinear reciprocation in said combustion chamber inwardly toward the axis of rotation of said rotor and outwardly toward said cam surface such that the centerline of said chamber, if extended, would pass through the axis of said rotor,
and follower means for operatively connecting said piston to said oblong inner cam surface,
whereby said arcuate piston is urged outwardly to travel along said oblong inner cam surface and impart rotation to said rotor by combustion in said arcuate combustion chamber to provide the power stroke and is urged inwardly by travel along said inner cam surface to provide the compression stroke.

3,927,648
ELECTRONIC IGNITION TIMING CONTROL CIRCUIT FOR INTERNAL COMBUSTION ENGINE

Hisasi Kawai, Toyohashi, and Kazuo Iwase, Okazaki, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed June 4, 1974, Ser. No. 476,272
Claims priority, application Japan, June 5, 1973, 48-63471
Int. Cl.² F02P *5/08*
U.S. Cl. 123—117 R **8 Claims**

1. An electronic ignition timing control system for an internal combustion engine comprising:
revolution detecting means for detecting the number of revolutions per unit time of an internal combustion engine in digital value;
reference angular position detecting means for detecting a reference angular position of said engine to generate a reference angular position signal;
a revolution memory circuit connected to said revolution detecting means whereby in response to a revolution signal from said revolution detecting means, a revolution advance angle is read out, as a revolution retard angle from the reference angular position of said engine, from a predetermined ignition timing characteristic program;
advance angle-frequency converting means connected to said revolution memory circuit for converting said revolution retard angle into a frequency by generating the frequency which varies with a predetermined functional relationship in accordance with an output signal read out from said revolution memory circuit;
a gating circuit connected to said advance angle-frequency converting means and said revolution detecting means and adapted to be opened to pass the output frequency of said advance angle-frequency converting means therethrough while a predetermined number of digital signals is generated from said revolution detecting means to

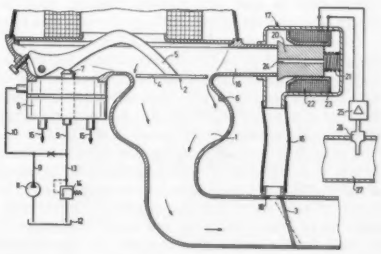


thereby inversely proportion said frequency with respect to the number of revolutions per unit time of said engine;
a counter connected to said gating circuit for outputting a digital value corresponding to a delay time from a moment at which a rotation of said engine passes said reference angular position by counting the output frequency of said gating circuit each time said gating circuit is opened; and
ignition timing signal generating means connected to said reference angular position detecting means and said counter for generating an ignition timing signal after a period of time corresponding to the count of said counter from a moment at which the reference angular position signal is generated in said reference angular position detecting means.

3,927,649
FUEL-METERING UNIT FOR INTERNAL COMBUSTION ENGINES

Gerhard Stumpp, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 18, 1973, Ser. No. 370,826
Claims priority, application Germany, Aug. 25, 1972, 2241936
Int. Cl.² F02M *7/00, 69/00*
U.S. Cl. 123—119 R **8 Claims**



1. In a fuel-metering unit adapted for use in an internal combustion engine having an exhaust pipe which unit com-

prises an air-intake suction tube, a randomly adjustable throttle valve therein, an air-measuring device mounted in said suction tube upstream of said throttle valve, by-pass means connected with said suction tube both upstream and downstream of said air-measuring device thereby bypassing said air-measuring device and means for metering fuel in amounts substantially proportional to the amount of air flowing through said suction tube past said air-measuring device, the improvement comprising: a solenoid valve; control valve means associated with said by-pass means and adapted for controlling opening of said by-pass means and thereby the amount of air passing said air-measuring device thereby varying the proportionality of fuel and air in dependence on characteristic engine data; and an exhaust gas-measuring probe adapted to be mounted in said exhaust pipe and adapted for controlling said control valve means, wherein:

said control valve means comprises control conduit means opening into said suction pipe and a by-pass valve adapted for pneumatic actuation via said control conduit means; and

said solenoid valve is interposed in said control conduit means and is controlled by said exhaust gas-measuring probe.

3,927,650

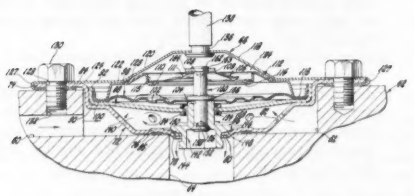
EXHAUST GAS RECIRCULATION VALVE

Claude A. Smith, Sandusky; David E. Taylor, Huron, and Donald L. Williams, Port Clinton, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 28, 1973, Ser. No. 419,667

Int. Cl.[2] F02M *25/06*

U.S. Cl. 123—119 A **2 Claims**



1. An exhaust gas recirculation control valve assembly for an internal combustion engine having an induction passage for air flow to the engine, a throttle rotatably disposed in said induction passage for controlling air flow therethrough, a slot in said induction passage disposed adjacent and traversed by said throttle, an exhaust passage for exhaust gas flow from the engine, and a recirculation passage having a first portion extending from said exhaust passage and a second portion extending to said induction passage downstream of said throttle, said control valve assembly comprising a housing adapted for disposition in said recirculation passage, said housing having an inlet aperture for receiving exhaust gases from said first recirculation passage portion and an outlet orifice for discharging exhaust gases to said second recirculation passage portion, a valve seat formed in said housing about said orifice, a valve member associated with said valve seat for controlling the amount of exhaust gas recirculated, a resilient diaphragm partitioning said housing and secured to said said valve member and providing means for urging said valve member against said valve seat, one side of said diaphragm being exposed to an exhaust back pressure signal occurring in said housing upstream of said valve seat and tending to move said valve member away from said valve seat upon an increase in said signal, said housing defining a chamber on the other side of said diaphragm, and means for subjecting said chamber to the pressure signal created at slot to cause said diaphragm to tend to move said valve member away from said valve seat upon a decrease in said slot pressure signal, whereby said valve member is moved away from said valve seat against the urging of said diaphragm by the complementary and superimposed effects of said pressure signals acting on said diaphragm to control the amount of exhaust gas recirculated through said recirculation passage to said induction passage.

3,927,651

DEVICE FOR VAPORIZING FUEL

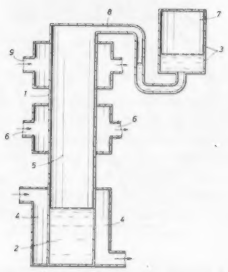
Geoffrey A. Harrow, Wirral, England, and Walter D. Mills, Mold, North Wales, assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 13, 1975, Ser. No. 540,484

Claims priority, application United Kingdom, Jan. 23, 1974, 3171/74

Int. Cl.[2] F02M *31/00*

U.S. Cl. 123—122 A **7 Claims**



1. In the combination: (1) a combustion chamber-containing apparatus selected from the group consisting of an internal combustion engine and a gas turbine, and (2) a device for vaporizing liquid fuel prior to its introduction into the combustion chamber of said apparatus which device comprises a heat pipe which is in the form of a sealed vessel containing a heat transfer fluid comprising a vaporizable liquid having a boiling point at atmospheric pressure up to 400°C and a non-condensable gas, which heat pipe comprises:

a. a heat-receiving zone operatively engaging the exhaust system of said apparatus, for heating the heat transfer fluid and vaporizing said liquid with the heat from said exhaust system,

b. a heat-discharging zone operatively engaging the fuel inlet system of said apparatus for cooling and condensing the heat transfer liquid by transference of heat to said fuel to be evaporated, said heat discharging zone communicating with said heat receiving zone whereby condensed heat transfer liquid is directly returned to said heat receiving zone, and,

c. at least one heat transfer liquid storage zone in communication with the heat receiving zone or the heat discharge zone for storage of the heat transfer liquid,

the improvement comprising that the capacity of said storage zone is sufficient to store all of the heat transfer liquid and a portion of the non-condensable gas present in the device.

3,927,652

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Cormac G. O'Neill, Lafayette, Calif., assignor to Physics International Company, San Leandro, Calif.

Filed June 21, 1974, Ser. No. 481,666

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AT **10 Claims**

1. In an internal combustion engine, a fuel injection system comprising

first fuel pump means for providing a supply of fuel at a first pressure,

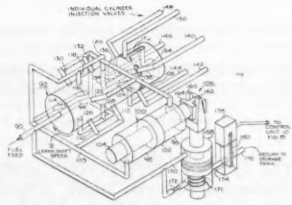
second fuel pump means for providing a supply of fuel at a second pressure, said second pressure being higher than said first pressure,

injection nozzle means for each cylinder for injecting fuel when open into a cylinder of said engine,

means for measuring the amount of fuel to be injected into said cylinder,

means for storing fuel to be injected into said cylinder by said injection nozzle means,

means for transferring said measured amount of fuel to said means for storing fuel for storage thereby at said first pressure,



means for applying fuel from said means for storing fuel to said injection nozzle means at said first pressure to apply an opening bias,

means for applying fuel from said second pump means at said second pressure to said injection nozzle means to maintain said injection nozzle closed against the pressure of said fuel at said first pressure,

timing means actuated responsive to operation of said internal combustion engine for producing a signal when the time for fuel injection by said injection nozzle means occurs, and

means responsive to said timing means signal for increasing the pressure of said stored fuel until it exceeds said second pressure thereby opening said injection nozzle means whereby said stored fuel is injected into said cylinder.

3,927,653
FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Brian Colin Pagdin, Sutton Coldfield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Mar. 5, 1973, Ser. No. 338,681

Claims priority, application United Kingdom, Mar. 4, 1972, 9944/72

Int. Cl.[2] F02D *1/04*, *1/06*; **F02M** *39/00*

U.S. Cl. 123—140 MC **13 Claims**

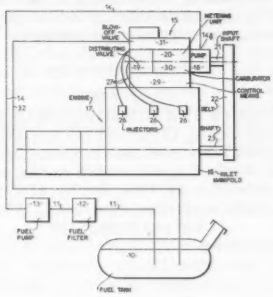
1. In fuel injection apparatus for an internal combustion engine said apparatus comprising means defining an air inlet duct, an adjustable throttle valve means controlling flow of air therethrough to the engine, fuel inlet means and fuel outlet means for connection to one or more injectors, pump means for establishing flow of fuel from said inlet means to said outlet means at an injecting pressure for delivery from said injector, metering means for delivering a measured quantity of fuel to said outlet means in each cycle of operation of the engine, and drive means for driving said metering means in timed relation with said engine, the improvement comprising the provision in combination of:

a. sensing means for controlling operation of the metering means and including

i. a single pressure sensing means for sensing absolute pressure of air in said air inlet duct,

ii. a temperature responsive sensing means for sensing air temperature in said air inlet duct, each of said pressure and temperature sensing means providing a mechanical output,

b. mechanism for receiving said mechanical outputs from said pressure sensing means and said temperature sensing means on the one hand and transmitting a mechanical output to said metering means on the other hand for imparting to the latter a setting which is a function of both absolute pressure and air temperature, representing air density, in said air inlet duct,



c. enclosure means having boundary walls defining a chamber in direct communication with the air flow path through said inlet duct, said chamber being common to and enclosing said pressure sensing means and said mechanism, for isolating said pressure sensing means and said mechanism from the influence of any pressure medium other than the air in said inlet duct, said apparatus being free of any mechanical inputs to said mechanism which traverse said boundary walls,

d. means directly mechanically connectiing said pressure sensing means and said mechanism within said chamber for transmitting said mechanical output from said pressure sensing means to said mechanism without traversing any of said boundary walls of said chamber.

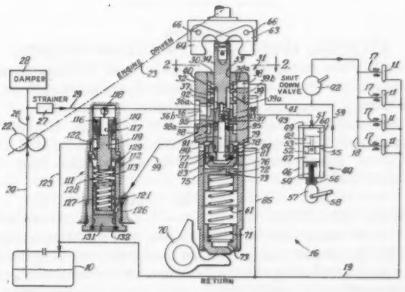
3,927,654
FUEL SUPPLY SYSTEM

Julius P. Perr, Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.

Filed Aug. 22, 1973, Ser. No. 390,605

Int. Cl.[2] F02D *1/04*, *1/06*

U.S. Cl. 123—140 FG **16 Claims**



1. A fuel supply system for an internal combustion engine, comprising an engine driven pump means for drawing fuel

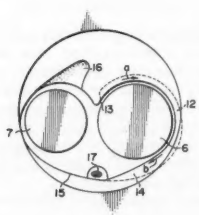
from a fuel supply and delivering the fuel to a fuel line leading to injectors of the engine, bypass pressure regulator module means connected to said line for regulating the pressure in said line by bypassing a portion of the pump output, engine speed responsive means separate from said pump means for producing a speed representative signal, said module means being connected to receive said signal and operating to adjust the amount of fuel bypassed as a function of said speed representative signal and thereby regulating the pressure in said line as a function of engine speed and independently of the output of said pump at an intermediate engine speed range, and governor means separate from said module means and connected to said line for regulating the fuel pressure in said line at maximum speed range, said module means and said governor means functioning independently of each other and said module means further functioning in said maximum speed range when said governor means is operative.

3,927,655

STRUCTURE OF THE COMBINATION CHAMBER OF INTERNAL COMBUSTION ENGINES

Kenji Goto, and Takao Niwa, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Mar. 26, 1974, Ser. No. 454,930
Claims priority, application Japan, Oct. 8, 1973, 48-113039
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—191 R **6 Claims**



1. The structure of a combustion chamber of an internal combustion engine comprising a cylinder head provided with an intake port and an intake poppet valve which selectively opens or closes said intake port, wherein a part of the inner surface of the cylinder head forming a peripheral portion of the intake port is provided with a dam portion adapted to cooperate with the peripheral edge portion of said intake valve when said valve is in its open position so as to define an arcuate channel extending along said peripheral edge portion, said arcuate channel having a gradually increasing cross sectional area from one end toward the other end thereof.

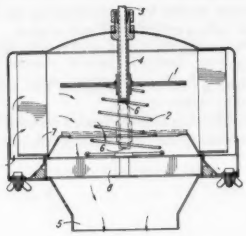
3,927,656

STOPPING INTERNAL COMBUSTION ENGINES

Alan Brydon Reed, Stockton-on-Tees, and William Stanley May, High Wycombe, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 171,425, Aug. 13, 1971, abandoned. This application Sept. 27, 1973, Ser. No. 401,174
Claims priority, application United Kingdom, Aug. 24, 1970, 40662/70
Int. Cl.[2] F02B *77/00*
U.S. Cl. 123—198 D **9 Claims**

1. In an internal combustion engine, an air intake, a source of inert gas under pressure and an emergency stopping device, said device including a stop valve movable between a normally open position in which atmospheric gases pass into said air intake and a closed position in which atmospheric gases are prevented from passing into said air intake, means for supplying inert gas to said stop valve from said source, and means forming part of said stop valve for passing the inert gas received from said source through said stop valve to said air intake when said stop valve is in its closed position.

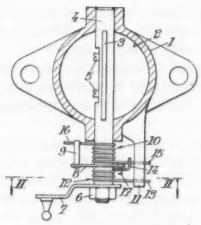


3,927,657

THROTTLE RETURN SYSTEMS FOR CARBURETTORS

Francois Mennesson, Nanterre, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Mar. 26, 1974, Ser. No. 454,834
Claims priority, application France, Apr. 5, 1973, 73.12369
Int. Cl.[2] F02B *77/08;* **F02D** *11/04*
U.S. Cl. 123—198 D **2 Claims**



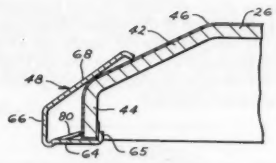
1. In a carburettor for an internal combustion engine having a throttle member secured to a rotary shaft and adapted to be angularly moved with respect to the carburrettor body by control means, resilient return means for biasing said throttle member toward a minimum opening position, comprising: a first helical torsion return spring wound around the shaft and having a first end retained in fixed relation with respect to the carburettor body and its other end operatively connected to said shaft for exerting a return force on said shaft; a second helical torsion spring wound around the shaft and having a first end which is retained in fixed relation with respect to the carburettor body and its other end in abutting relation against said first end of the first spring which retains said second spring in stressed condition; a lever; and abutting means carried by said lever, said abutting means being non-rotatably connected to said throttle member and located on the path followed by said other end of the second spring when clear from abutment, whereby said second spring unwinds upon breakage of said first spring and exerts on said abutting means a force tending to move said throttle member toward its closed condition.

3,927,658

SELF-LOCKING TRIM FRAME FOR BUILT-IN COOKTOP

Eugene G. Olthuis, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Dec. 19, 1974, Ser. No. 534,580
Int. Cl.[2] F24C 15/10; H05B 3/68
U.S. Cl. 126—214 A 6 Claims



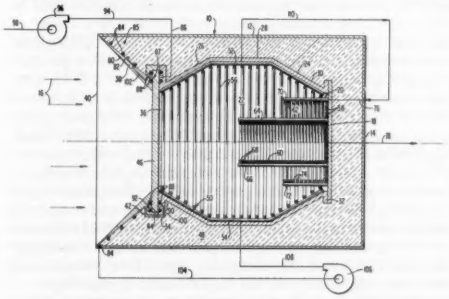
1. An appliance adapted to be supported in an opening in a supporting structure, said appliance having a peripheral rim adapted to overlie the peripheral edge of the said opening, at least some of the weight of the appliance being carried on said peripheral edge of the opening through the said peripheral rim, the said peripheral rim including a down-turned flange; the invention comprising a self-locking trim frame of flexible sheet material encircling the peripheral rim of the appliance, said trim frame having a bottom flange with locking means for engaging the down-turned flange of the said peripheral rim, said trim frame also having a top flange for overlying the top portion of the said peripheral rim, said trim frame being stretchable to slip over the said peripheral rim so when it is released in place it is held firmly therewith.

3,927,659

PEAK EFFICIENCY SOLAR ENERGY POWERED BOILER AND SUPERHEATER

Floyd A. Blake, Littleton, and Murlin T. Howerton, Denver, both of Colo., assignors to Martin Marietta Corporation, New York, N.Y.

Filed Sept. 21, 1973, Ser. No. 399,670
Int. Cl. F24j 3/02
U.S. Cl. 126—271 7 Claims



1. In a solar energy powered steam boiler and superheater for converting concentrated solar radiation to thermal energy form, said boiler and superheater including: a tubular enclosure having one end closed defining an energy conversion chamber and being axially aligned with a solar energy radiation field, a first, superheater heat exchanger extending across the closed end of said enclosure chamber, said other end of said chamber being open to said radiation field and forming a solar radiation receiving aperture, a second, tubular, boiler heat exchanger within said enclosure and positioned between said aperture and said superheater heat exchanger, thermal insulation between said heat exchangers and the walls of said enclosure, means fluid coupling said heat exchangers to permit fluid flow from said second heat exchanger to said first heat exchanger and means for supplying water to said second heat exchanger and removing superheated steam from said first heat exchanger, the improvement comprising:

a light window in the form of a circular plate sealably overlying said aperture of said enclosure chamber and being opaque to infra-red radiant energy and which absorbs some of said infra-red radiation and being positionable in the focal plane of the concentrated solar radiation,

a frustoconical reflecting surface surrounding said window, extending axially toward the solar radiation field and being flared radially outward of said window to reflect fringe solar energy into said chamber through said light window,

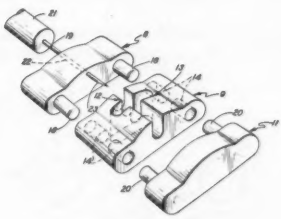
annular duct means position at the circular plate periphery for cooling said plate window to prevent self destruction thereof, said duct means comprising a third heat exchanger fluid coupled to said second heat exchanger and upstream thereof to preheat the boiler feed water and a fourth heat exchanger fluid coupled to said second heat exchanger and upstream thereof and mounted to said frusto conical reflecting surface to prevent its self destruction and to further preheat the boiler feed water.

3,927,660

LYMPH DUCT CANNULATOR AND METHOD

Charles John Tegtmeyer, Charlottesville, Va., assignor to North American Instrument Corporation, Hudson Falls, N.Y.

Filed Jan. 11, 1974, Ser. No. 432,733
Int. Cl.[2] A61B 6/00
U.S. Cl. 128—2 A 15 Claims



1. A small isolated vessel cannulator comprising

A. a rectangular vessel holder having proximal and distal end(s) surfaces, an open groove extending between said holder end(s) surfaces, and appropriately sized to receive and permit distension of said isolated vessel,

B. a rectangular needle inserter having proximal and distal end(s) surfaces, and a channel extending between said inserter end(s) surfaces and appropriately sized to permit a needle to pass therethrough without play.

and first means (to) slidably (secure) securing in a fixed position said inserter to said holder with said channel and said groove being in continuous longitudinal alignment and with one of said proximal end surfaces having facing contact with one of said distal end surfaces.

3,927,661
ULTRASONIC WAVE DIAGNOSIS APPARATUS WITH GALVANOMETER-DRIVEN PROBE

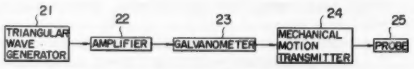
Yasuhiko Takemura, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Oct. 11, 1974, Ser. No. 514,181

Claims priority, application Japan, Oct. 15, 1973, 48-115616; Oct. 15, 1973, 48-119731[U]; Oct. 15, 1973, 48-119735[U]; Oct. 15, 1973, 48-119736[U]

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 V **10 Claims**



1. In a ultrasonic wave diagnosis apparatus of the class wherein a probe for transmitting and receiving ultrasonic wave to and from a portion of a patient to be diagnosed, is scanned in a sector shape, the improvement which comprises galvanometer means operatively connected to said probe, a triangular wave generator, and means for applying the output of said triangular wave generator to said galvanometer means to cause it to swing at a uniform angular speed.

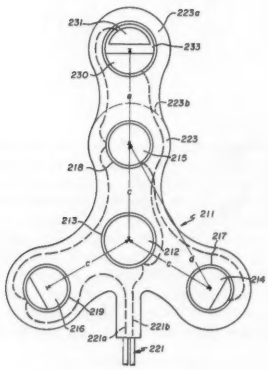
3,927,662
ULTRASONIC TRANSDUCER ASSEMBLY

Janis Gunars Ziedonis, Cranbury, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 206,012, Dec. 8, 1971, Pat. No. 3,847,016. This application Nov. 8, 1974, Ser. No. 522,171

Int. Cl.² A61B 5/00

U.S. Cl. 128—2 V **47 Claims**



1. An ultrasonic multiple-element transducer assembly for use particularly in patient monitoring, comprising a substantially flattened base of homogeneous, flexible material composition, which includes a cloverleaf-like configured portion having a center area with at least three arms extending outwardly therefrom, the arrangement of said arms being such as to be independently flexible relative to each other and to the center area, with each arm having proximate said center area narrower width and thickness dimensions than the other arm area and said center area, for enabling the assembly to conform to varying body curvatures, each of said arms being provided proximate the end thereof remote from said center portion with at least one active element in the form of a transmitting means, said transmitting means being arranged and including lens means for providing overlapping direct beam illumination of a predetermined volume of the interior of the patient's body intended to be monitored, and said center area being provided with at least one active element in the form of an ultrasonic receiving means, said ultrasonic receiving means including lens means arranged to provide illumination of a substantially greater percentage of the portion of the patient intended to be monitored than that provided by the said transmitting means associated with any of said arms of said cloverleaf portion, for enabling detection by said receiver means of ultrasonic energy from whichever of said transmitting means is illuminating the portion of the patient's body intended to be monitored at any time, wherein the middle arm of said cloverleaf configured portion is extended to provide for at least one additional active element for predetermined greater longitudinal and/or transverse coverage.

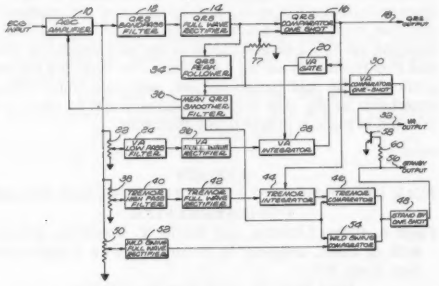
3,927,663
METHOD AND APPARATUS FOR DETECTING CARDIAC ARRHYTHMIAS

Robert H. Russell, Pasadena, and Allan L. Wolff, San Marino, both of Calif., assignors to Phsiological Electronics Corporation, San Marino, Calif.

Filed May 2, 1974, Ser. No. 466,317

Int. Cl.² A61B 5/04

U.S. Cl. 128—2.06 A **21 Claims**



10. In a method for continuous analysis of an electrocardiographic signal to detect ventricular abnormalities, which method includes filtering said electrocardiographic signal to detect QRS signal components in the frequency range of about 10 to 20 Hertz, comparing said detected QRS signal components with a first threshold reference level for generating a gating signal indicative of the initiation of a QRS complex whenever the amplitude of the detected components exceeds that of the first threshold reference level, said gating signal having an interval corresponding to a selected succeeding portion of a QRS complex, further filtering said electrocardiographic signal to detect low frequency signal components below about 10 Hertz, integrating said low frequency signal components during said gating signal interval, and comparing said integrated components with a second threshold reference level for generating an output signal indicative of ventricular abnormalities when said integrated signal level exceeds said threshold reference level, the improvement comprising:

further filtering said electrocardiographic signal to detect higher frequency artifact noise and electrical power interference signal components in a range above about 25 Hertz;

successively and separately integrating said higher frequency signal components during each interval between successive detections of QRS complexes to produce an integrated output indicative of the total high frequency noise signal energy present throughout each such interval;

comparing the level of each said integrated output with a variable threshold reference level to generate a standby output signal whenever said integral exceeds said variable threshold reference level; and,

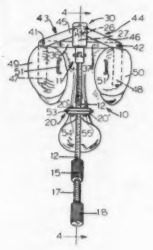
interrupting said output signal indicative of ventricular abnormalities in response to said standby output signal for a predetermined time interval extending over at least several successive QRS complexes.

3,927,664

APPARATUS FOR USE IN THE CORRECTION OF MAXILLARY AND PREMAXILLARY CONDITIONS IN INFANTS

Nicholas G. Georgiade, Durham, and Ralph A. Latham, Chapel Hill, both of N.C., assignors to University of North Carolina, Chapel Hill, N.C., by said Ralph A. Latham

Filed Nov. 20, 1974, Ser. No. 525,508
Int. Cl.² A61F 5/00
U.S. Cl. 128—76 R 7 Claims



1. A mouth cavity maxillary bone correction apparatus, comprising:

a. a pair of elongated laterally spaced arm members having outer end portions residing in a common plane and adapted for intra-oral placement and securement to corresponding laterally displaced maxillary bone and opposite inner end portions adapted to extend intra-orally from such securement;

b. a pair of plate means molded to conform and to be secured to said bone, said plate means being secured to respective said arm member outer end portions thereby adapting such outer end portions to be secured to said bone;

c. housing means adapted to be intra-orally placed and formed by connected walls and positioned between and rearwardly of said plate means, said housing providing integral outwardly extending portions for making pivotal connections with medial portions of said arm members enabling said arm members to be pivoted thereon, said housing walls being formed to receive the respective said arm member inner end portions within said housing and to allow corresponding reciprocal movements therein;

d. screw block positioning means adapted to be intra-orally placed and slidably mounted and confined within said housing such that said positioning means is isolated from any surrounding mucosal tissue during use thereof, said positioning means being between and having surfaces loosely engaged with said inner end portions of each of said arm members to control the positioning thereof, said positioning means having a shaft drive enabling said inner end portions to be moved in an extra-oral direction to effect corresponding outward pivotal movements of said arm member outer end portions; and

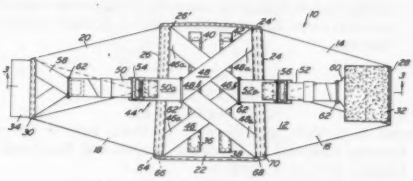
e. drive means including a drive shaft having one inner end adapted to be intra-orally placed and connected to drive said positioning means by the turning of said drive shaft and having the other outer end thereof adapted to be extra-orally placed and adapted for finger engagement to effect rotation thereof whereby as said drive shaft is rotated in an appropriate direction and with respective said arm member outer end portions secured to said bone through said plate means, the lateral spacing of said bone may be increased to effect appropriate correction thereof.

3,927,665

LUMBO-SACRAL SUPPORT

Jerome R. Wax, c/o Posturchek Orthopedic Products, Sharon Hill Industrial Park Calcon Hook Road, Sharon Hill, Pa. 19079

Filed June 21, 1974, Ser. No. 481,638
Int. Cl.² A61F 5/02
U.S. Cl. 128—78 15 Claims



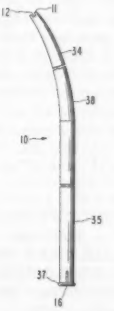
1. An orthopedic support comprising a substantially elastic band member adapted to encircle the body and to overlie the lumbo-sacral region of the back of a wearer, a pair of spaced substantially upright bars coupled to and extending transversely with respect to the circumferential axis of said band member and disposed on opposite sides of the spine of a wearer when the support is operatively disposed, and substantially inelastic tensioning means coupled to said band member and adapted to tension said band member so as to apply circumferential compression to the pelvis of a wearer, said tensioning means having end portions thereof anchored to respective zones of attachment on said band member disposed on opposite sides of the spine of a wearer and further portions thereof extending across the spine of a wearer when said support is operatively disposed, said end portions extending across and overlying said bars so as to apply distributed forces thereto to press said bars into supporting engagement with the lower back of the wearer.

3,927,666

INSERTER FOR INTRAUTERINE DEVICE

Seymour Hoff, San Jose, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 308,596, Nov. 21, 1972, Pat. No. 3,880,156. This application Jan. 20, 1975, Ser. No. 542,283
Int. Cl.² A61F 5/46
U.S. Cl. 128—130 11 Claims



1. An inserter for an intrauterine device comprising a transverse member and a leg member depending therefrom, the inserter comprising:

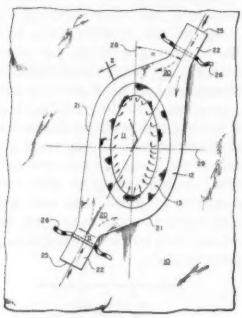
a. an elongated tapered tubular member having a leading section and a trailing section distant from the leading section;

b. a pair of notches in the terminus of the tubular member at its leading section, said notches adapted to orient and engage the transverse member of the device;
c. a hollowed area extended within the tubular member of dimension such that the leg portion of the device can be introduced and positioned therein; and
d. wherein the taper extends along the leading section of the member to exteriorly form a surface adapted to mate with the transverse member of the device when in collapsed configuration during the insertion of the device within the cervical canal and when the device is housed within the inserter.

3,927,667
DIFFUSER DRAPE

Ernest E. Criddle, and Pierrette L. Neals, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 21, 1974, Ser. No. 471,886
Claims priority, application Canada, May 16, 1974, 200154
Int. Cl.² A61F *13/00*
U.S. Cl. 128—132 D **3 Claims**



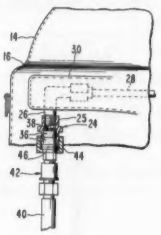
1. A diffuser drape comprising:
a. a drape member having a substantially elliptical aperature therein;
b. inflatable clean air duct means of substantially elliptical shape integral with said drape and surrounding said aperture;
c. diffuser means in said clean air duct means surrounding said aperture and shaped to diffuse, in operation, low velocity clean air radially through the diffuser means outwardly of the periphery thereof and inwardly across said aperture from opposite sides thereof to produce a resultant flow away therefrom; and
d. at least two opposed clean air inlets for said clean air duct means on the underside of said drape member, which clean air inlets are sleeve means flared to merge substantially tangentially into said duct means and inclined at an angle of between 22° and 35° to the longitudinal axis of said aperture.

3,927,668
DUAL PURPOSE AIR INLET METHOD FOR HEAD ENCLOSURE

Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.

Continuation of Ser. No. 237,310, March 23, 1972, abandoned. This application Oct. 10, 1974, Ser. No. 513,909
Int. Cl.² A62B *18/04*
U.S. Cl. 128—142.7 **1 Claim**

1. A method for selectively supplying either cooled or pressurized breathing air to a person exposed to a contaminated atmosphere comprising the steps of:
a. providing a head enclosure means defining a substantially closed air space area for surrounding the person's head and including an air inlet for directing breathing air into the interior of said enclosure means;
b. providing a source of relatively high pressure air;
c. providing a source of low pressure cooled air;
d. selectively connecting either said source of high pressure air or said source of low pressure cooled air to said head enclosure means inlet via a dual purpose air inlet connection having a chamber for receiving a sound absorbing member;

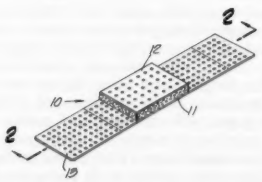


e. inserting a sound absorbing member into said chamber from a location outside of said chamber when said head enclosure means is connected to said source of relatively high pressure air and
f. removing said sound absorbing member from said chamber when said head enclosure means is connected to said source of low pressure cooled air.

3,927,669
BANDAGE CONSTRUCTION

Linda R. Glatt, Los Angeles, Calif.

Filed Nov. 16, 1973, Ser. No. 416,444
Int. Cl.² A61L *15/00*
U.S. Cl. 128—156 **8 Claims**

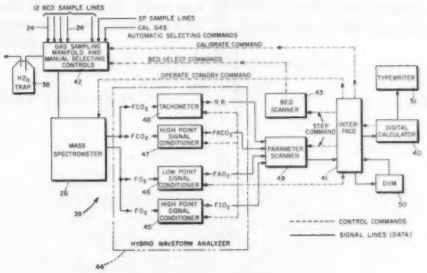


1. A bandage construction comprising:
a pliable strip;
a quantity of adhesive substantially covering one surface of said strip; and
a hydrophilic pad of a porous air permeable cellular material, the body portion surrounding the cells constituting a means for tenaciously holding body fluids, said pad adhering to said strip for being located in use over the wound and immediately adjacent areas.

3,927,670
AUTOMATIC RESPIRATORY GAS MONITORING SYSTEM

Stephen Z. Turney, 320 Morris Ave., Lutherville, Md. 21093; Walter Blumenfeld, 3934 Memphis Lane, Bowie, Md. 20715; R. Adams Cowley, 1010 St. Paul St., Baltimore, Md. 21202; Samuel Wolf; Charles McCluggage, both c/o University of Maryland Hospital, Baltimore, Md. 21201, and John W. Ashworth, III, 817 Fairway Drive, Towson, Md. 21204

Filed Jan. 5, 1973, Ser. No. 321,140
Int. Cl.² A61B *5/08*
U.S. Cl. 128—2.07 **29 Claims**



1. A system for monitoring respiratory gases, which comprises:

means for withdrawing respiratory gases from the airway of at least one patient,

means for rapidly analyzing the withdrawn gases and for developing analog waveforms in response to the analyzation of the withdrawn gases where the waveforms are representative of fractional concentrations of the withdrawn gases,

means responsive to the developed analog waveforms for developing voltage levels proportional to the maxima and minima of the developed analog waveforms where the maxima and minima of the waveforms are representative of monitored values of inspired and expired respiratory gases, and

means responsive to the developed voltage levels for displaying in visual form an indication of the maxima and minima values.

3,927,671
IRRIGATION SOLUTION ADMINISTRATION SYSTEM AND RESERVOIR THEREFOR

Richard Marion Chittenden, Grayslake, and Earl David Wilson, Ingleside, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

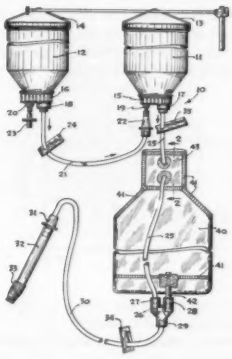
Division of Ser. No. 140,407, May 5, 1971, Pat. No. 3,756,237.
This application Mar. 16, 1973, Ser. No. 341,807
Int. Cl.² A61M *3/00*
U.S. Cl. 128—227 **5 Claims**

1. Apparatus for the administration of fluid in a surgical procedure comprising:

a container of fluid having an outlet port,

a reservoir for storage of fluid having a common inlet and outlet port allowing fluid to flow into and out of said reservoir,

said outlet port of said container and said common port of said reservoir connected in parallel to a manifold in communication with an instrument to be used in said procedure, whereby fluid from said container can flow through

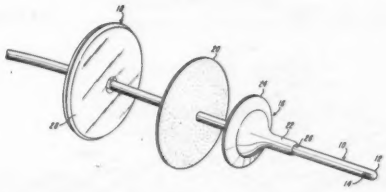


said manifold to fill said reservoir and a constant flow of fluid to said instrument can be provided.

3,927,672
DEVICE FOR SEALING BODY CAVITY DURING INTRODUCTION OF FLUID TO OR EXTRACTION OF FLUID FROM SAID CAVITY

Fe Garcia, Detroit, Mich., assignor to Saul A. Rosenblum, Detroit, Mich., a part interest

Filed Sept. 12, 1973, Ser. No. 396,485
Int. Cl.² A61M *3/00*
U.S. Cl. 128—245 **9 Claims**

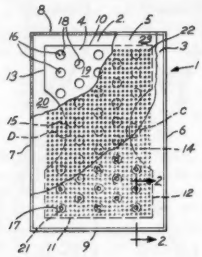


1. Apparatus for use in delivering fluid to and/or from a body cavity while maintaining a seal thereof comprising a catheter type tube, one end of which is adapted for insertion through an opening to said cavity, a first sealing member mounting on said tube, and a second sealing member mounting on said tube in following relation to the first said member, said sealing members being adjustable in a sense longitudinally of the tube following insertion of said tube end, to seal the opening to said body cavity about said tube, the first sealing member being contoured to enter said opening to bridge and form a seal between the outer surface of said tube and the edge of the body opening, the second said sealing member having a transverse dimension greater than that of the first and serving as a back-up for the first and including in connection therewith, a moisture absorbing medium.

3,927,673
QUILTED DIAPER

Glenn N. Taylor, Cary, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,492
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 23 Claims

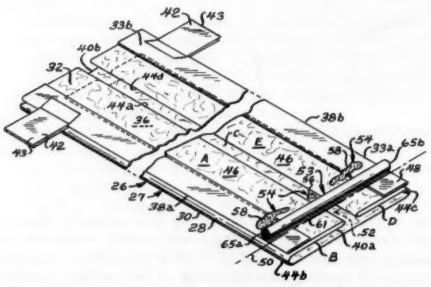


1. An absorbent article for use as a diaper or the like comprising in operative combination:
   a. a first backing sheet of generally fluid resistant material, having marginal edges,
   b. a second sheet of generally fluid resistant material,
   c. said second sheet having a plurality of apertures therein,
   d. an absorbent pad structure disposed between said first and said second sheets,
   e. said absorbent pad having a plurality of apertures therein, said apertures being larger than the apertures in said second sheet,
   f. said first and said second sheets being secured to each other in registry with said pad apertures in at least a part of the area defined by said pad apertures, and
   g. the marginal edges of said first and second sheets being secured to each other to make a unitary absorbent article.

3,927,674
ABSORBENT ARTICLE WITH DISPOSAL MEANS

Charles H. Schaar, Lake Zurich, Ill., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,960
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 25 Claims

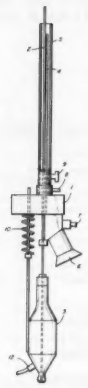


1. A disposable diaper, comprising:
an absorbent pad assembly having a pair of waistline portions, a front surface, and a back surface, and
a disposal bag having a cavity and opening means communicating with said cavity, said bag being formed into a configuration of reduced dimensions and being located and retained in one of said waistline portions of the pad assembly, whereby said bag may be extended to enlarged dimensions after use of the diaper for placement of the soiled diaper in the bag and retention therein.

3,927,675
DEVICE FOR FRAGMENTING URINARY CALCULUS

Reimar Pohlman, 33, Im Johannistal, and Manfred Cichos, 12, Weingartshof, both of 51 Aachen, Germany

Filed Nov. 8, 1973, Ser. No. 413,864
Claims priority, application Germany, Nov. 16, 1972, 2256127
Int. Cl.² A61B 17/00
U.S. Cl. 128—328 21 Claims

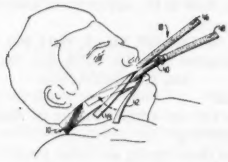


1. A device for fragmenting urinary calculus in combination with a cystoscope and comprising a liquid-tight flexible tubular probe means, said cystoscope having guide means for accommodating the probe means, said probe means slidably mounted in the cystoscope, a flexible, elongate sound conductor extending through the probe means from one end to the other end of the probe means, a rebound element disposed at the other end of the probe means having at least one cutting edge and loosely mounted in relationship to the conductor, said probe means including means at the other end of the probe means for slidably receiving said rebound element, and means for oscillating said sound conductor ultrasonically whereby said rebound element in response to the conductor is cyclically slidable and independently movable of the conductor to contact and fragment the urinary calculus.

3,927,676
ENDOTRACHEAL TUBE SECURING DEVICE AND METHOD

Kenneth E. Schultz, 7601 SW. 117th St., Miami, Fla. 33156

Filed Aug. 1, 1974, Ser. No. 493,920
Int. Cl.² A61M 25/02
U.S. Cl. 128—351 9 Claims



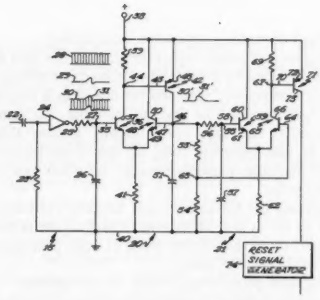
1. A disposable device for securing an in-service endotracheal tube to an intubated patient comprising an elongated

strip of flexible tape of a predetermined width, the width of said strip being substantially greater than the thickness thereof, said strip having a non-adhesive central portion of sufficient length to be nonadheringly positioned about the patient's neck, end portions extending oppositely from the central portion, at least one of said end portions including means for facilitating bifurcation of said at least one end portion, said means being located substantially intermediate the width of said strip, each of said end portions having an adhesive coating on one side thereof for adhesively securing said end portions to said tube whereby when the central portion is positioned about the intubated patient's neck, the end portions can be drawn around and secured to the endotracheal tube to thereby prevent dislodgment of said tube.

3,927,677
DEMAND CARDIAC PACER

David H. Gobeli, St. Paul, and John M. Adams, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed July 12, 1974, Ser. No. 488,045
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 PG **15 Claims**



1. In a demand cardiac pacer of the type having input and output means adapted to be connected to the heart, the input means including means for sensing natural heart activity, having a resettable pulse generator and having means for generating a pulse generator reset signal in response to the sensing of natural heart activity, the improvement which comprises:

first means connected to said heart activity sensing means for establishing a reference level representative of sensed extraneous repetitive noise and a second level, said second level being greater in absolute value than said reference level by an amount representative of sensed heart activity; and

second means connected to said first means and differentially responsive to said reference level and said second level for generating a signal indicative of the sensing of heart activity when the difference between said reference level and said second level exceeds a predetermined value.

3,927,678
CONCAVE FOR AN AXIAL FLOW THRESHING AND SEPARATING MACHINE

Edward W. Rowland-Hill, Lancaster, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed May 2, 1974, Ser. No. 466,100
Int. Cl.² A01F *7/06*
U.S. Cl. 130—27 T **8 Claims**

1. An axial flow threshing and separating machine comprising:

A. a frame adapted to travel across a field,

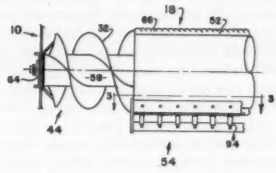
B. at least one cylindrical casing mounted on the frame having top and sidewall portions,

C. means mounted on the forward portion of said frame to deliver material from the field to the casing,

D. rotor means extending longitudinally within said casing,

E. means mounted on the rotor and extending radially from said rotor to agitate and direct the material circumferentially and longitudinally through said casing,

F. concave means adjustably mounted to the sidewall portions, the concave means including a plurality of elongated beams having end and body portion the body portion containing a plurality of apertures therein,



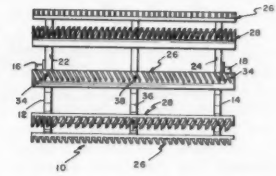
transverse members rigidly mounted to the ends of said beams to maintain said beams in spaced parallel relation to each other such that the appertures of said beams are in alignment with each other, spacing means positioned through said apertures and extending across the width of concave to form a grid through which threshed and separated material can pass, and

G. means rotatably mounted to the spacing means to facilitate the movement of said material over and through said concave.

3,927,679
THRESHING CYLINDER AND RASP BAR THEREOF

William S. Ausherman, 615 K St., Belleville, Kans. 66935

Continuation of Ser. No. 140,380, May 5, 1971, abandoned. This application July 24, 1974, Ser. No. 491,326
Int. Cl.² A01F *12/22*
U.S. Cl. 130—27 HA **2 Claims**



1. A threshing cylinder having a direction of rotation comprising a plurality of mounting plates spaced along and extending radially from the axis of the cylinder, an even numbered plurality of elongated rasp bars circumferentially equally spaced about and equidistant from said axis, with said rasp bars being parallel to said axis, each of said mounting plates having radial extremities engaging the rasp bars, and means detachably securing the rasp bars to the radial extremities of the plates, each of said rasp bars consisting of a toothed and elongated web having a lateral extent that is entirely and solely defined by contiguous first and second portions thereof having an integral junction, said first portion trailing the second portion with respect to the direction of rotation of the cylinder and having a radially outward surface that is throughout its entire lateral extent substantially normal to a radial line from the web to the axis of the cylinder, said second portion of the web having a radially outward surface of approximately planar configuration constituting a merging forward continuation of

the surface of the first portion and which is inclined throughout its entire lateral extent substantially both radially inwardly and forwardly therefrom with respect to the direction of rotation of the cylinder, and a longitudinally extending row of teeth integral with the first portion of the web, said teeth projecting radially outward from the radially outward surface of the first portion of the web, with each of said teeth extending substantially the entire transverse extent of said first portion of the web and being inclined at an acute angle with respect to the longitudinal extent of the web and having a forward end portion with respect to the direction of rotation of the cylinder, said forward end portion of the tooth projecting radially outward from the web and being disposed adjacent the juncture of the first and second portions of the web, said forward end portion of the tooth being beveled to present a radially outward extending sharp edge that faces forwardly with respect to the direction of rotation of the cylinder, said teeth of each row being parallel to each other, with the rows of teeth circumferentially adjacent rasp bars being oppositely inclined, said first and second portions of the web being substantially flat and of substantially equal thickness with the radially outward surfaces thereof jointly defining a dihedral angle in the range of about 210° to 240°, and said forward end portions of the teeth projecting radially outward from the radially outward surface of the first portion of the web a distance that is in the range of about 15% to 55% of the transverse extent of radially outward surface of the second portion of the web, said rasp bar being defined entirely and solely by said toothed first portion and by said second portion of said web.

3,927,680

MACHINE FOR PICKING HOPS

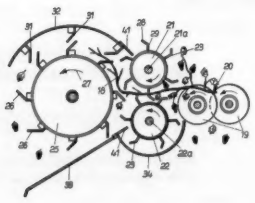
Johann Stefan, Geisenfeld, and Hermann Daum, Feucht near Nurnberg, both of Germany, assignors to Fella-Werke G.m.b.H., Nurnberg, Germany

Filed Feb. 26, 1974, Ser. No. 443,513

Claims priority, application Germany, Feb. 16, 1973, 2307614

Int. Cl.² A01D *46/02*

U.S. Cl. 130—30 D **12 Claims**



1. Apparatus for performing a secondary picking operation in a hop picking machine, such apparatus comprising separating means, said separating means being adapted to free umbels from other hop vine material, a pair of spaced draw-in rollers, said rollers being positioned downstream of the separating means, means providing hollows between said pair of rollers, for receiving the said other hop vine material, means for rotating the pair of draw-in rollers in opposite directions, a picking drum, said picking drum being provided with spaced apart picking fingers on its periphery and being arranged downstream of the draw-in rollers, a curved cover, said cover having a surface, fixed picking fingers, said fixed picking fingers being positioned on said surface of said cover, and being spaced from the said picking drum so that the fixed picking fingers and the picking fingers on the drum can cooperate to perform a picking operation and means for rotating the picking drum at a higher speed than the speed of rotation of the draw-in rollers.

3,927,681

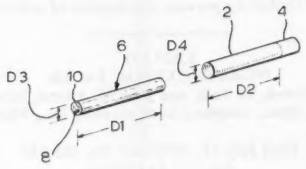
APPARATUS FOR MAKING CIGARETTES

Percy W. Bramhill, Dollard des-Ormeaux, Canada, assignor to H. H. Investments Limited, Montreal, Canada

Division of Ser. No. 334,983, Feb. 23, 1973, Pat. No. 3,822,710. This application July 3, 1974, Ser. No. 485,670

Int. Cl.² A24C *5/02, 5/22, 5/54*

U.S. Cl. 131—70 **2 Claims**



1. A method of making cigarettes, comprising:

1. inserting into an empty cigarette tube, of the kind having one end blocked by a filter tip, a tobacco cartridge consisting of compressed tobacco contained in a thin sheath of non-consumable low friction material, the length of said tobacco cartridge being slightly greater than the length of said cigarette tube, so that a portion of said tobacco cartridge projects beyond the other end of said cigarette tube;
2. compressing the tobacco in said tobacco cartridge back at least as far as said other end of said cigarette tube, so that a portion of said sheath alone extends past said other end of said cigarette tube;
3. gripping such projecting portion of said sheath;
4. and creating relative separating movement between said projecting portion of said sheath and said tobacco, whereby to strip said sheath from said tobacco, leaving said tobacco in said cigarette tube.

3,927,682

AIR-CURING PROCESS OF TOBACCO LEAF

Susumu Matsuyama; Seishiro Hirabayashi; Bunkichi Iida, and Hajime Miki, all of Yokohama, Japan, assignors to The Japan Tobacco and Salt Public Corporation, Japan

Filed Oct. 2, 1974, Ser. No. 511,162

Claims priority, application Japan, Oct. 27, 1973, 48-120392

Int. Cl.² A24B *03/12*

U.S. Cl. 131—140 R **4 Claims**

1. Air-curing process of tobacco leaf which comprises:

A. subjecting tobacco leaf selected from the group consisting of leaves of burley tobacco, domestic (Japanese) tobacco and cigar tobacco to the routine manner of the air-cure so as to prepare the leaf in which the yellowing is completed and the moisture content thereof is reduced to 40–70 percent,

B. bruising the yellowed leaf in step (A) mechanically to such an extent that the whole of the leaf tissue contains moisture uniformly and appears as if water has soaked therein,

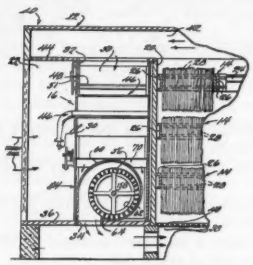
C. heating the bruised leaf in step (B) at a temperature of 90°–130 °C so as to stop the enzymatic reaction in the leaf, and

D. drying the leaf treated in step (C) at 50°–60 °C while aeration is carried out.

3,927,683
BULK CURING BURLEY TOBACCO WITH A SEVEN DAY CURING CYCLE

Robert W. Wilson, Charlotte, N.C., and Eugene T. Akins, Bennettsville, S.C., assignors to Powell Manufacturing Company, Inc., Bennettsville, S.C.

Filed Oct. 15, 1974, Ser. No. 515,092
Int. Cl.² A24B *1/02, 3/12, 9/00, 15/00*
U.S. Cl. 131—140 R **9 Claims**

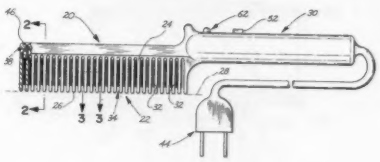


1. A method of curing green primed burley tobacco leaves in a condition of whole leaves and/or parts thereof which comprises the steps of supporting a compacted bulk mass of primed burley leaves within a confined zone with the flat surfaces of the burley leaves disposed generally vertically at positions such that a flow of forced air within said confined zone will pass between the flat surfaces of the burley leaves of said compacted bulk mass, establishing a substantially continuous flow of forced air vertically between the flat surfaces of the burley leaves of said compacted bulk mass while said bulk mass is supported within said confined zone for a first time period at a temperature less than a predetermined level while controlling the relative humidity of the air sufficient to maintain a relatively high moisture content level in the burley leaves so that substantially all of the chlorophyll in the burley leaves is oxidized unmasking sequentially the yellow and brown pigments present in the burley leaves, substantially continuously maintaining a forced flow of air while maintaining said support of the bulk mass within said confined zone for a generally immediately following second time period at a temperature which is gradually increased and held at an intermediate elevated level while controlling the relative humidity of the air sufficient to initially arrest any chemical action taking place at the end of the first time period including the aforesaid chlorophyll oxidation and to dehydrate the burley leaves to an intermediate lower moisture content level at the end of the second time period, substantially continuously maintaining a forced flow of air while maintaining said support of the bulk mass within said confined zone for a generally immediately following third time period at a temperature which is gradually increased and held at an upper elevated level while controlling the relative humidity of the air sufficient to bring the burley leaves to a crisp and fragile condition at the end of the third time period, and maintaining air at a reduced temperature level in contact with the burley leaves while maintaining said support of the bulk mass for a generally immediately following fourth time period while controlling the relative humidity of the air sufficient to provide the burley leaves with a final moisture content permitting them to be handled without substantial breakage, the improvement in said procedural steps wherein said first time period does not exceed approximately 80 hours and the total of said first, second, third and fourth time periods does not exceed approximately 168 hours, and wherein the temperature of the air contacting the burley leaves during said first period is gradually increased at a rate not less than approximately ½° per hour and not greater than approximately 5° per hour until a temperature of approximately 105°F is reached which temperature is held until the desired brown color is reached.

3,927,684
HAIR-GROOMING IMPLEMENT

Peter W. H. Lam, Los Angeles, Calif., assignor to R. W. Hodgson, Hollywood, Calif.

Filed Sept. 9, 1974, Ser. No. 504,566
Int. Cl.² A45D *24/00*
U.S. Cl. 132—11 R **11 Claims**



1. A hair-grooming implement, comprising: a comb-mounting base member provided with a plurality of substantially transversely directed teeth spaced therealong and similarly projecting outwardly from one side thereof and terminating at outer free comb teeth ends lying in a substantially brushing inner contact plane, at least certain adjacent spaced ones of said teeth being provided with heat-conductive, heat-transmissive, hair-contacting surface means positioned along inner surfaces of said teeth facing intervening hair-strand-receiving comb teeth spaces defined between said teeth and adapted to physically mechanically contact and be drawn along intervening hair strands during a hair-grooming operation while simultaneously applying heat to said groomed hair strands along the length thereof for softening and increasing the compliancy of said hair strands temporarily during a hair-grooming operation; heating means for the transmission of heat from a heat source to said heat-conductive and heat-transmissive hair-contacting surface means carried by said comb teeth when placed in operative condition, said heating means being effectively mounted within said comb-mounting base member and being provided with thermally conductive heat flow means connected therefrom and extending to the outer heat-conductive, and heat-transmissive hair-contacting, surface means positioned along inside surface portions of adjacent teeth; and thermal insulator means effectively completely surrounding said heating means carried within said comb base mounting member and also effectively surrounding and fully enclosing the heat flow means except for the inner adjacent hair-contacting surfaces thereof defined and comprised by said thermally conductive and thermally transmissive hair-contacting surface means positioned along facing adjacent inner surfaces of said comb teeth, thus providing a structure completely isolating the thermally conductive and transmissive hair-strand-contacting surface means from any possible external contact with a person using the hair-grooming implement, or with any other exterior physical surface, except to hair strand means passed between adjacent teeth during a hair-combing and hair-grooming operation.

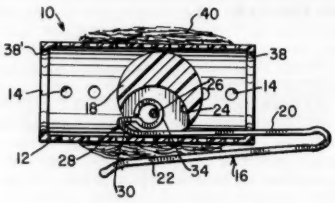
3,927,685
HAIR CURLER

Jules Bontempi, 46-26 215th Place, Bayside, N.Y. 11361

Continuation-in-part of Ser. No. 504,195, Sept. 9, 1974. This application Mar. 27, 1974, Ser. No. 455,046The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.
Int. Cl.² A45D *2/00*
U.S. Cl. 132—40 **8 Claims**

1. A device for use in curling a strand of hair comprising: a hollow cylindrical member over which the strand of hair is wound, said cylindrical member having at least one open end and having a uniform internal diameter

throughout the length of said cylindrical member, a clip assembly including a spring clip defined by a pair of resilient opposed legs integrally connected at their trailing ends and separated at their leading ends, means freely rotatably connecting said clip assembly to said cylindrical member open end so that said spring clip legs are freely rotatable in a plane generally transverse to the cylindrical axis of said cylindrical member and located adjacent said



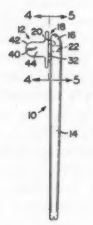
cylindrical member open end, said freely rotatably connecting means including a spherical member of slightly smaller diameter than said cylindrical member uniform internal diameter, said spherical member being axially slidably mounted within said cylindrical member and also being freely rotatably mounted within said cylindrical member at said cylindrical member open end, and means pivotally connecting the leading end of one of said spring clip legs to said spherical member.

3,927,686

DENTAL FLOSS HOLDER

James B. Zambito, 1504 S. Arrawana, Tampa, Fla. 33609

Continuation-in-part of Ser. No. 316,392, Dec. 18, 1972, abandoned. This application Nov. 12, 1973, Ser. No. 414,854
Int. Cl.[2] A61C *15/00*
U.S. Cl. 132—91 7 Claims



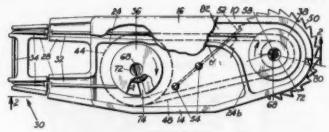
1. A dental floss holder comprising: a handle, a floss holding head attached to said handle, connecting means attached to said handle, both said head and said connecting means being dimensioned and configured to be detachably connected to one another, said head comprising a plurality of legs disposed in spaced relation to one another, whereby floss means is positionable between said legs; base means comprising indentation means formed thereon and dimensioned and configured to frictionally and removably engage said head, attachment means interconnected between said base and said handle and disposed to movably connect said head to said handle, said attachment means comprising detachment means including a plunger means movably mounted on said handle and positionable into engagement with said head, whereby said head may be dislodged from said indentation means within said base means.

3,927,687

COMBINATION SHAFT AND SPOOL STRUCTURE

I. Bruce Thierman, 8817 N. Swenson St., Portland, Oreg. 97203

Filed Apr. 18, 1974, Ser. No. 461,853
Int. Cl.[2] A61C *15/00*; B65H *75/28*
U.S. Cl. 132—92 A 8 Claims



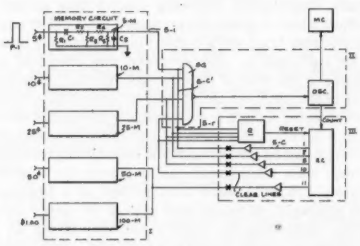
1. A combination shaft and spoon structure comprising:
a. a shaft having a free end,
b. means defining a diametral slot in said free end of the shaft,
c. a spool having an outer surface drum portion for winding line thereon,
d. an axial bore in said spool arranged to receive said shaft from one end of said spool,
e. spline-like means on said shaft and spool establishing a locked drive connection therebetween,
f. and means defining a diametral slot in said spool leading from the said one end part way through the spool toward the other end in intersecting relation with said bore and terminating in an end wall in the plane of the outer surface drum portion whereby a line can be attached to the drum and wound on said drum portion by disposing it in the diametral slot in the shaft prior to installing the spool on the shaft and then rotating the shaft after installing the spool thereon.

3,927,688

ELECTRONIC COIN COUNTER

Alfred Cohn, Culver City, and James S. Reynolds, Canoga Park, both of Calif., assignors to Alfred Cohn, Culver City, Calif.

Filed Nov. 4, 1974, Ser. No. 520,308
Int. Cl.[2] G07F *5/16*
U.S. Cl. 133—8 R 20 Claims



1. An electronic counting circuit for receiving a plurality of like input signals on a plurality of different respective input terminals, each terminal and associated signal representing a different coin denomination, the circuit comprising in combination therewith:
a plurality of input storage means, one provided coupled to each respective said terminal for storing input signals received at said respective terminal;
mechanical counter means;
free-running pulse generating means coupled in common to be energized by said storage means, said pulse generator being responsive to signals stored in said storage means for issuing output counting pulses until the signals stored

in said storage means are cleared therefrom by applied clearing signals, each counting pulse representing the lowest coin denomination or a multiple thereof, said pulse generating means applying said output counting pulses to said counter to advance said mechanical counter means accordingly; and

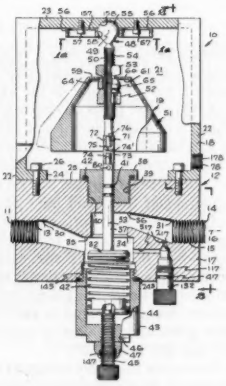
electronic clearing means including a digital counting circuit having a prescribed number of counting states and associated output terminals which are successively driven to produce predetermined output signals in accordance with the counting state of said counting means, said terminals each being coupled to a respective one of said storage means through a prescribed coupling circuit; said counting circuit being coupled to said pulse generating means for receiving said counting pulses, said counting circuit being incremented thereby to responsively sequence itself through said counting states to successively apply said predetermined output signals to said respective storage means as clearing signals thereto whereby a clear signal is successively impressed, in turn, upon each of said associated storage means for clearing the storage means to reflect receipt of associated counting pulses corresponding to the coin denomination represented by the storage means.

3,927,689

EARTHQUAKE RESPONSIVE SAFETY VALVE

Mark B. Sharp, North Hollywood, and Robert E. Sharp, Thousand Oaks, both of Calif., assignors to Quake-Proof, Inc., Reseda, Calif.

Filed Feb. 25, 1974, Ser. No. 445,515
Int. Cl.² F16K *17/36*
U.S. Cl. 137—45 **15 Claims**



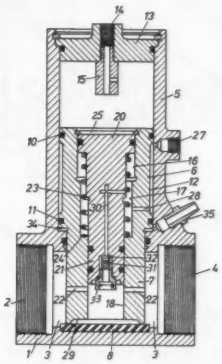
1. A safety device comprising a valve unit yieldingly urged toward closed position, a member movable in a lateral direction between a normal position of engagement with said valve unit for holding the valve unit open and a laterally deflected position releasing the valve unit for closing movement, a weight element carried by said member for movement in said lateral direction therewith and operable to move in said lateral direction and displace said member in that direction from said normal position in response to shock, and means mounting said weight element to said member for limited movement relative thereto in response to minor shock forces without release of the valve unit.

3,927,690

PRESSURE FLUID VALVE HAVING FULLY OPENED, FULLY CLOSED AND RESTRICTED FLOW POSITIONS

Nils Axel Agren, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed June 3, 1974, Ser. No. 475,499
Claims priority, application Sweden, June 18, 1973, 7308558
Int. Cl.² F16K *31/143*
U.S. Cl. 137—599.2 **10 Claims**



1. Pressure fluid valve for controlling the impact power of pneumatic rock drills by selectively establishing a closed, a substantially unobstructed fully open and a restricted flow passage, comprising:

a housing having a power cylinder **5** and a throughpassage **3** for pressure fluid;

an elongated main valve body **7** movably mounted in said housing and being transversely movable between a rear position in which said through-passage **3** is fully and substantially unobstructedly opened, and a forward position in which said through-passage **3** is blocked;

a control piston **6** reciprocably guided within said power cylinder **5** and coupled to said main valve body **7**;

said main valve body **7** being provided with a transverse, restricted flow passage **22** and a coaxial bore **18** extending axially throughout said main valve body **7**;

an auxiliary valve body **21** reciprocably guided within said coaxial bore **18** of said main valve body **7** for movement between a position covering said restricted flow passage **22** and a position uncovering said restricted flow passage **22**;

said control piston **6** having an opening at its rear end portion communicating with the rear end of said auxiliary valve body **21**; and

a pressure fluid inlet **14** at the rear portion of said power cylinder **5** through which pressure fluid is suppliable onto the rear end of said control piston **6** and the rear end of said auxiliary valve body **21** for moving said main valve body **6** into its through-passage **3** blocking position and said auxiliary valve body **21** into its restricted flow passage **22** covering position.

3,927,691

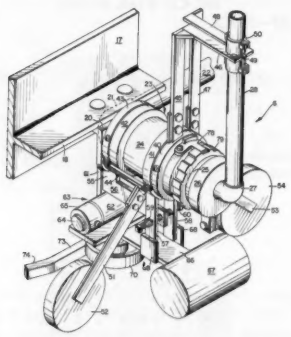
FLUID CONDUCTOR

David F. Bennett, 1100 Fleetwood Ave., Daytona Beach, Fla. 32014

Filed Oct. 10, 1974, Ser. No. 513,571
Int. Cl.² B65G *53/40*
U.S. Cl. 137—615 **7 Claims**

1. A fluid conductor comprising a first swivel having one end communicating with a vacuum source, a first rigid conduit section having a first end connected to the other end of said

swivel and disposed at substantially a right angle to the axis thereof, a second rigid conduit section disposed substantially parallel to said first conduit section, rigid conduit means including a second swivel interposed between and connecting a second end of said first conduit section to a first end of said second conduit section, a third rigid conduit section, a third swivel having one end connected to a second end of the second conduit section and an opposite end connected to a first end of said third conduit section, said third conduit section having a second inlet end connected to and movable with a reciprocally moving support, and counterbalancing means supported rotatably on said first swivel and releasably engaging said first rigid conduit section for returning said section to an upright position from an inclined position in either direction.

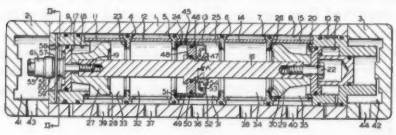


3,927,692

FOUR-WAY POPPET VALVE DEVICE

Tom C. Wenrich, Lexington, Ky., assignor to American Standard, Inc., New York, N.Y.

Filed June 28, 1974, Ser. No. 484,156
Int. Cl.² F16K *11/02*
U.S. Cl. 137—625.27 **6 Claims**



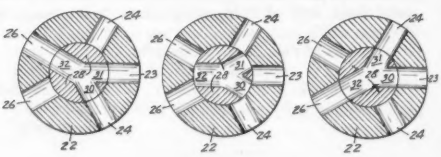
1. A poppet valve device comprising:
a. a casing having a plurality of fluid pressure inlet and outlet ports;
b. a plurality of annular valve seats coaxially fixed and axially spaced at certain intervals in said casing;
c. a valve stem coaxially disposed and axially reciprocably operable a predetermined axial distance in said casing between a first position and a second position; and
d. a plurality of annular valve members axially spaced apart on said valve stem for movement therewith, said valve members cooperating with said valve seats for controlling establishment and cut-off of communications between certain ones of said inlet and outlet ports in the first position of said valve stem, and between the others of said inlet and outlet ports in the second position of the valve stem,
e. a cup-like member having on the annular opposite ends thereof two adjacent ones of said valve members disposed at an axially spaced apart distance less than the axial distance between two adjacent ones of said valve seats to form a dual valve unit one or the other of whose valve members is alternatively seatable on one or the other of said two adjacent valve seats, respectively, depending upon the position of said valve stem; and
f. a cylindrical guide member coaxially fixed on the valve stem and on which said dual valve unit is coaxially slidably mounted to form a lost motion connection between the dual valve unit and the valve stem for providing a limited amount of relative axial movement therebetween and consequent axial positional adjustment of one or the other of the valve members of the dual valve unit relative to one or the other of said adjacent valve seats in either of said first or second positions, respectively, of the valve stem to compensate for wear or excessive manufacturing tolerance of any of the valve members.

3,927,693

HIGH-PRESSURE VALVE

Clyde P. Johnston, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 11, 1974, Ser. No. 514,125
Int. Cl.² F16K *11/00*
U.S. Cl. 137—625.47 **3 Claims**



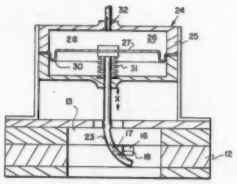
1. A high-pressure valve comprising a valve body having a cylindrical chamber therein, said chamber having an inlet port with an axis which is perpendicular to the axis of said chamber, a first set of two outlet ports having axes which are perpendicular to the axis of said chamber and which lie in a plane common to the axis of said inlet port, each of said first outlet ports having a cross-sectional area equal to said inlet port, said first set of outlet ports being disposed one on each side of said inlet port at equal angles from said inlet port, the angle between the axis of said first outlet ports and the axis of each said inlet port being less than 90°, and a second set of two outlet ports having axes which lie in said plane, each of said second set of outlet ports having a cross-sectional area greater than the area of said inlet port and being disposed at equal angles from said inlet port, the angle between each axis of said second set of outlet ports and the axis of said inlet port being greater than 90° but less than 180°;
a cylindrical valve core rotatably mounted in said chamber, said core having a Y-shaped configuration of three communicating passageways having axes disposed within said plane, two of said passageways being disposed so as to communicate simultaneously with said inlet and one of said first set of outlets while simultaneously the third passageway communicates with one of said second set of outlets; and
means attached to said core for rotating said core to align said passageways with said inlet and outlets;
the angles between the axes and the cross-sectional area relationships between said inlet port, said outlet ports and said passageways being selected such that when fluid under pressure is present in said valve the vector forces on said valve core due to the pressure of the fluid are essentially balanced to zero so said valve core can be easily rotated.

3,927,694

FLUIDIC COMPUTATIONAL DEVICE

Donald R. Struttmann, Tempe, and William F. Ryan, Scottsdale, both of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed July 11, 1974, Ser. No. 487,507
Int. Cl.² F15C 3/14; F15D 1/14
U.S. Cl. 137—829 8 Claims



1. A fluidic computational device comprising:

a. a fluidic amplifier having a body forming a reaction chamber with a jet nozzle at one side communicating with an inlet for fluid under predetermined pressure and at least one output port leading from the reaction chamber at the side opposite said jet nozzle, fluid under said predetermined pressure supplied to said inlet being formed by said nozzle into a fluid beam directed toward said output port;

b. a deflector element projecting into the reaction chamber between said jet nozzle and said output port, said element being of elongated form with a circular cross section and nonlinearly shaped in a longitudinal, nonaxial direction to traverse the path of the fluid beam at a predetermined nonlinear rate relative to linear movement of the deflector element in an axial direction in said reaction chamber; and

c. means for linearly moving said deflector element in said axial direction in said reaction chamber, said means having an actuator responsive to a variable input pressure, the portion of the path of the fluid beam traversed by said deflector element and the resulting pressure in said output port bearing a predetermined nonlinear relation to said linear movement of the deflector element in said axial direction.

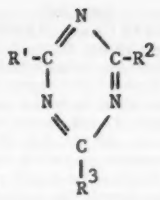
3,927,695

SILICONE RUBBER HOSE

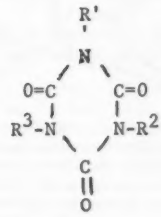
George Warren Crockwell, White Plains, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 21, 1973, Ser. No. 362,286
Int. Cl.² F16L 11/08, 11/06
U.S. Cl. 138—137 10 Claims

1. In a silicone rubber hose consisting essentially of a liner, reinforcement and cover element, the improvement wherein said reinforcement is polyethylene terephthalate in film form having a cured crosslinked, olefinic triazine modified silicone rubber directly bonded to at least one of the surfaces of said film, said rubber being derived by curing a heat-curable silicone gumstock composition comprising a crosslinkable diorganopolysiloxane gum; an olefinic triazine compound selected from the class consisting of cyanurates of the formula



wherein R′ and R² are hydrogen or a —O—R—CH=CH$_2$ radical and R³ is a —O—R—CH=CH$_2$ radical and R is an alkylene radical having from 1 to 4 carbon atoms, and isocyanurates of the formula



wherein R′ and R² are hydrogen or a —R—CH=CH$_2$ radical, R³ is a —R—CH=CH$_2$ radical and R is the same as defined above; and a catalyst.

3,927,696

PITCH-IMPREGNATED FIBER PIPE

Charles R. Gannon, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Division of Ser. No. 277,290, Aug. 2, 1972, which is a continuation-in-part of Ser. No. 224,216, Feb. 7, 1972, abandoned. This application June 26, 1973, Ser. No. 373,626
Int. Cl.² F16L 9/14
U.S. Cl. 138—243 3 Claims

1. An impregnated pipe having a uniform metallic exterior and interior aluminized surface and comprising a porous tubular body impregnated with an impregnant consisting essentially of:

a. unoxidized thermal petroleum pitch and,

b. leafing aluminum pigment of ASTM designation 926-66 in a concentration of at least 0.3 percent by weight of both pigment and pitch, said unoxidized thermal petroleum pitch at least partially permeating into the pore spaces of said tubular body and forming a film of pitch having a metallic aluminized surface of leafing aluminum pigment extending over the surface of said tubular body.

3,927,697
QUARTZ GLASS ELEMENTS

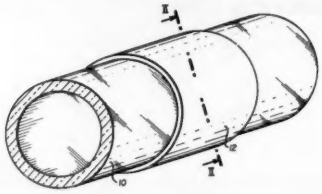
Peter Baumler, Dornigheim; Gerhard Hofer, Bruchkobel; Tassilo Korner, Erlensee; Heinrich Mohn, Hailer; Karl Seiler, Hanau-Hohe Tanne; Fritz Simmat, Meerholz, and Karlheinz Rau, Hanau, all of Germany, assignors to Heraeus-Schott Quarzschmelze GmbH, Hanau, Germany

Division of Ser. No. 166,844, July 28, 1971, Pat. No. 3,776,809, Continuation-in-part of Ser. No. 793,775, Jan. 24, 1969, abandoned, Continuation-in-part of Ser. No. 810,713, March 26, 1969, abandoned. This application July 27, 1973, Ser. No. 383,432

Claims priority, application Germany, Feb. 22, 1968, 1696061; Mar. 30, 1968, 1771077; Mar. 30, 1968, 1988697The portion of the term of this patent subsequent to Dec. 4, 1990, has been disclaimed.

Int. Cl.[2] B32B *17/06;* F16L *9/14*

U.S. Cl. 138—145 11 Claims



1. Quartz glass element capable of forming an outer layer of uniformly fine crystalline silica when heated to a temperature at which such crystalline silica forms containing from about 4 to about 800 ppm of crystallization promoting nuclei having a rate of diffusion in quartz glass less than that of sodium at elevated temperatures, said nuclei being present in the entire volume of said glass element.

7 Quartz glass element consisting essentially of a quartz glass tube having an outer cohesive coating of uniformly fine crystalline silica.

3,927,698
INSTALLATION CHANNEL

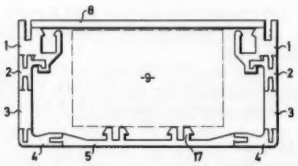
Rolf Johannsen, Traunreut, Germany, assignor to Intermercury Finance and Trading Co., Ltd., Grand Cayman, British W. Indies

Filed June 6, 1974, Ser. No. 476,771

Claims priority, application Germany, July 24, 1973, 2337628

Int. Cl.[2] F16L *9/22*

U.S. Cl. 138—162 6 Claims



1. A service installation channel comprising a plurality of elongated strip-like components interconnected in successive manner along their longitudinally extending peripheral edges with complementary tongue-and-groove joints that provide positive interlocking connection, there being at least two uppermost strip-like components forming each sidewall and with the two uppermost strip-like components of each side wall having a first tongue-and-groove joint similar to those between other adjacent pairs of interconnected strip-like components comprising the service installation channel and an additional interconnected tongue-and-groove joint extending laterally inwardly adjacent said first tongue-and-groove joint.

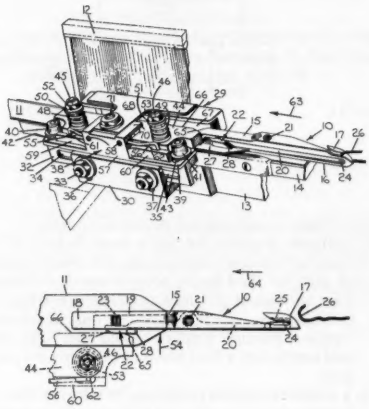
3,927,699
WEFT CARRIER CONTROL APPARATUS

Richard Louis Volpe, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 29, 1974, Ser. No. 518,651

Int. Cl.[2] D03D *47/22*

U.S. Cl. 139—122 N 1 Claim



1. In a shuttleless loom of the type for inserting single picks of weft into separate sheds of warp threads by opposed reciprocating carrier members carried on the free ends of flexible tapes, an improved apparatus for controlling the actuation of the gripper finger of the weft extending carrier comprising:

a. camming means mounted on said loom in a manner providing for movement between an operative position where it is contacted by the weft carrier to release weft from the gripper finger and in inoperative position where no contact causing operation of the gripper finger is effected;

b. means defining an off set lip forming one end of the gripper finger disposed for operative engagement with said camming means having;

1. a forward vertical side defining a first cam engaging surface for actuating the gripper finger to release the weft as the carrier is being withdrawn from the shed;

2. an upper horizontal surface with a downwardly tapered leading end defining a second cam engaging surface for displacing said camming means to prevent actuation of the gripper finger during movement of the carrier into the shed, said camming means including:

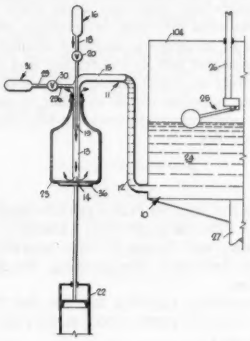
A. a biasing means for returning said camming means to its operating position after being displaced by said second cam engaging surface; and

B. a further biasing means for continually urging said camming means toward its position of engagement with said first cam engaging surface.

3,927,700
BOTTLE FILLING MEANS AND METHOD

John Thomas Trinne, Box 197, Greenock Road, Nuriootpa, Australia (5355), and Leslie John Wilksch, King St., Stockwell, Australia (5350)

Filed June 12, 1974, Ser. No. 478,539
Claims priority, application Australia, June 25, 1973, 3818/73
Int. Cl.² B65B 3/04
U.S. Cl. 141—5 12 Claims



11. A method of filling a bottle with liquid, wherein the bottle surrounds a depending outlet arm of a syphon tube which has its discharge opening at its lower end, the syphon tube having an inlet arm entering a reservoir and terminating below a liquid level therein and also having a bridge portion extending between the upper ends of the arms, there being a gas flow conduit connected to a supply of inert gas at pressure terminating at its discharge end in the syphon tube and directed in the direction of syphon induced flow, the method comprising maintaining liquid in the reservoir at said liquid level, injecting gas into the syphon tube to

a. displace at least some of the air contained in the bottle with gas, and

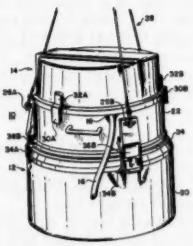
b. reduce the pressure in the syphon tube sufficiently to induce liquid flow,

and removing the bottle from the syphon tube after the liquid in the bottle has risen to said liquid level.

3,927,701
SAMPLE COLLECTOR

Louis Franklin Lederer, Lincoln, Nebr., assignor to Instrumentation Specialties Company, Lincoln, Nebr.

Division of Ser. No. 241,033, April 4, 1972, Pat. No. 3,838,719. This application Nov. 1, 1973, Ser. No. 411,683
Int. Cl.² B65B 3/04; F25D 3/02
U.S. Cl. 141—98 13 Claims



1. A liquid sampler for sampling liquids from within a sewerage system comprising:

a substantially cylindrical casing of small enough size to fit through a sewerage manhole;

said casing including at least a substantially cylindrical vertical outer wall and bottom wall defining a bottle holding compartment;

means for drawing fluid containing sewage into said casing and depositing it into at least one bottle;

a substantially cylindrical ice compartment centered within said bottle holding compartment;

said casing including first, second and third sections;

said means for drawing fluid including control programming means for automatically controlling the time said fluid is drawn in accordance with a predetermined program;

said first section containing said bottle holding compartment and means for distributing said fluid to a plurality of different bottles;

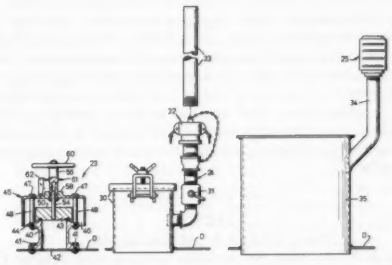
said second section being mounted on top of said first section and containing said control programming means; and

said third section being an inverted cover fitting over said second section.

3,927,702
EMERGENCY OVER-FILL ASSEMBLY FOR MARINE VESSELS

James E. Ingle; Ralph W. Emerson, and John S. Megahan, all of Tell City, Ind., assignors to Maxon Marine Industries, Inc., Tell City, Ind.

Filed Nov. 1, 1974, Ser. No. 519,877
Int. Cl.² B65B 31/00
U.S. Cl. 141—285 7 Claims

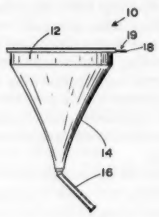


1. An emergency over-fill assembly for relieving excessive pressure or cargo build-up in a compartment in a marine vessel and securable to the deck of said vessel, said assembly comprising a part having an opening therethrough that communicates between the compartment to be filled and atmosphere, said part having an upper end which terminates above said deck, said assembly further including a cover at the upper end of said part, said cover having a passage through which said opening can communicate with atmosphere, a sealing member shiftably mounted within the cover between a compartment sealing position wherein it closes communication between said opening and atmosphere and a compartment open position wherein it permits communication between said opening and atmosphere, locking means adjustably mounted on said cover and having a locked position and an open position, said sealing member engagable by said locking means whereby said locking means when in said locked position acts to hold said sealing member in said compartment sealing position and when said locking member is adjusted to an open position, said sealing member can automatically raise from its compartment sealing position wherein it is maintained by gravity to a release position upon excessive pressure or cargo build-up in said compartment.

3,927,703
MOVABLE EXTENSION FOR A FUNNEL

Everett E. Beaubien, Lake Elmo, Minn., assignor to Twin Tool, Inc., St. Paul, Minn.

Filed July 15, 1974, Ser. No. 488,514
Int. Cl.² B65B 39/00; B67C 11/02
U.S. Cl. 141—333 5 Claims

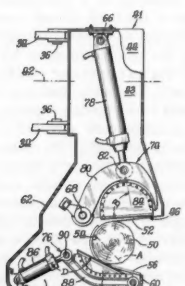


1. An articulated movable extension for a funnel which funnel has a large inlet end tapering down to a smaller outlet end, the improvement comprising a generally annular ledge about the inside of the outlet end of the funnel, said ledge projecting radially inward, and further comprising an extension with a connecting end adapted to fit snuggly inside the outlet end of the funnel and including a plurality of compressible tabs extending from the peripheral edge of the connecting end of the extension which tabs have annular ledge engaging projections thereon which comprise an angled surface extending radially outward and adapted to pull the extension into the funnel as the compressible tabs spring outward over said generally annular ledge so as to hold the extension in sealing relation with said outlet end and including risers molded just below the annular ledge engaging projections to keep the angled surface from locking too tightly over the annular ledge, and also including a cone shaped tapered surface on the inside of said funnel outlet end and a matching cone shaped tapered surface on the connecting end of said extension so as to provide a sealing joint, both tapered surfaces having a greater diameter nearer the outlet end of the funnel so as to be pulled into a sealing relationship under the action of said compressible tabs.

3,927,704
DUAL SHEAR BLADE ASSEMBLY

Leon A. Wirt, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 18, 1975, Ser. No. 550,329
Int. Cl.² A01G 23/08
U.S. Cl. 144—34 E 8 Claims



1. A dual shear blade assembly for cutting through an article, comprising;

a frame having an outwardly opening article receiving slot therein;

primary shear blade means pivotally mounted on said frame and movable between an open position outwardly adjacent one side of said slot to a closed position across a substantial portion of said slot;

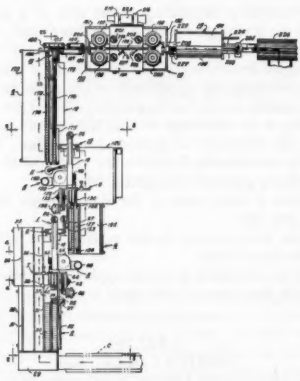
secondary shear blade means pivotally mounted on said frame and movable between an open position outwardly adjacent the opposite side of said slot to a closed position across a relatively small portion of said slot; and

motor means pivotally connected to said frame for swinging said primary and secondary shear blade means in the same rotational direction respectively from said open positions in an opposite endward manner towards said closed positions and so constructed and arranged as to cleanly sever an article disposed in said slot with disproportionate opposite forces in order to assure that the article is positively urged toward a fully retained position within said slot.

3,927,705
METHODS AND MEANS FOR CONTINUOUS VERTICAL FINGER JOINTING LUMBER

Jeff Y. Cromeens, and Thomas E. Clyce, both of Garland, Tex., assignors to Industrial Woodworking Machine Co., Inc., Garland, Tex.

Filed Aug. 16, 1973, Ser. No. 388,752
Int. Cl.² B27G 11/00; B27F 1/08
U.S. Cl. 144—317 10 Claims



1. The method of forming vertical finger jointed lumber from a plurality of short sticks having substantially uniform width and thickness and usually of nonuniform length comprising

positioning the sticks in a continuous sheet-like array in which said sticks are in side-by-side engagement and rest on their narrower surfaces with first ends thereof aligned in a first substantially straight edge,

effecting relative movement between the stick array and finger groove shaping means along the first substantially straight edge to cut serrations in the first end of each stick,

again reorganizing said array to again align the first ends of said sticks in a third substantially straight edge,

heating said first ends of said sticks while aligned in said third substantially straight edge,

applying adhesive to the second ends of said sticks,

stripping said sticks having heated first ends and adhesive coated second ends from said array serially and endwise, conveying said sticks in a substantially linear array away from said continuous sheet-like array,

joining and pressing together successive sticks moving in the linear array to mate heated and adhesive coated serrated ends of contiguous sticks to form bonded joints therebetween,

and cutting finger jointed lumber of selected lengths from the portion of said moving linear array having bonded joints between contiguous sticks.

3,927,706

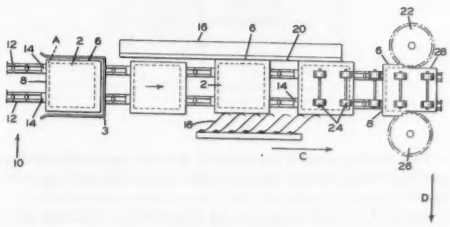
MANUFACTURING CEILING TILE

John R. Davey, Camp Hill, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 343,932, March 22, 1973, abandoned. This application July 3, 1974, Ser. No. 485,493

Int. Cl.² B27C *1/08*

U.S. Cl. 144—326 R **1 Claim**



1. The method for cutting the edge of an oversize board structure in a fixed relationship to a pattern on the surface thereof to form a ceiling tile, said board being oversize relative to the pattern placed on the board, said oversize board structure having a pattern on the surface thereof with the pattern placed at a certain fixed distance and parallel to a first edge of the oversize board and said pattern being placed on the oversize board structure relative to and parallel to a second edge of the oversize board structure, said second edge being at a 90° angle to said first board edge, the method comprising the steps of:

a. conveying the oversize board towards an edge-cutting means;

b. forcing said first edge of the board against a first fixed guide means so as to guide the first edge relative to the first fixed guide means;

c. holding the board relative to the means conveying the board once the board has established its relationship to the first fixed guide;

d. positioning the cutter structure of a first edgecutting means relative to the fixed guide so that, when the board structure passes from the fixed guide to the cutter structure, the cutter structure will cut the first edge of the board structure in a fixed relationship to the pattern on the board structure;

1. said cutter structure being composed of two cutting means which are spaced apart the distance desired for the width of the finished board and said first cutting means being positioned relative to the fixed guide so as to cut the edge of the board structure while said second cutting means is positioned relative to said first cutting means to cut the board to the desired width;

e. passing the oversize board structure adjacent a second fixed guide means and forcing said second edge of the board against the second fixed guide means so as to guide that edge relative to the fixed guide means, and

f. positioning a cutter structure of a second edgecutting means relative to the fixed guide so that, when the board structure passes from the second fixed guide means to the cutter structure, the cutter structure will cut the remaining two edges of the oversize board with said second certain edge being cut relative to the edge of the pattern on the board.

3,927,707

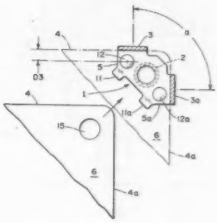
CLIP NUT

Thomas B. Wright, Diamond Bar, Calif., assignor to TRW Inc., Cleveland, Ohio

Filed Oct. 11, 1973, Ser. No. 405,321

Int. Cl.² F16B *37/04*

U.S. Cl. 151—41.75 **15 Claims**



1. A clip nut for attachment to a work panel in which converging edges define a corner with an aperture in the panel near the corner comprising:

a threaded nut element

a pair of lower arm portions integral with the nut element and extending in a plane normal to the longitudinal axis of the nut element at one end thereof, the arms extending divergently at a predetermined angle to each other;

a pair of upper arm portions spaced from the lower arm portions and extending substantially over the lower arm portions;

an upstanding portion integral with and connecting the respective upper and lower arm portions;

the upstanding portions comprising respectively means for contacting convergent edges of a work panel defining a corner therein and having an aperture at the corner alignable with the threaded nut element, whereby when the clip nut is fitted to such a work panel corner by contact of the upstanding portions substantially throughout their length with the convergent edges, the aperture will be aligned with the element.

3,927,708

AUTOMATIC TIRE PRESSURE CONTROL

Clement E. Hulme, 9947 S. Avenue N , Chicago, Ill. 60617

Filed Jan. 28, 1974, Ser. No. 437,065

Int. Cl. B60c *23/12*

U.S. Cl. 152—418 **6 Claims**

1. Air compressor apparatus for maintaining pressure in the tire of an automotive vehicle and comprising:

a crankshaft to be connected to the vehicle axle to rotate therewith;

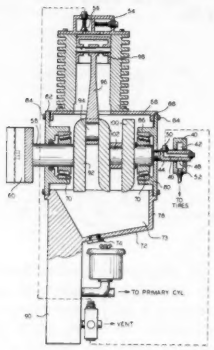
air compressor cylinder means having a piston connected to said crankshaft, said cylinder means comprising primary and secondary cylinders, a filter for supplying atmospheric air to the primary cylinder, and a first conduit between the output of the primary cylinder and the input of the secondary cylinder;

a housing encompassing said crankshaft and having bearing means for rotatably supporting said crank shaft;

an unloader valve settable to the desired tire pressure and effective to release compressed air to the atmosphere when the tire pressure is above a preset value;

a second conduit connecting the output of the secondary cylinder to the unloader valve to supply air under pres-

sure to the unloader valve;
a third conduit for connecting the unloader valve to the



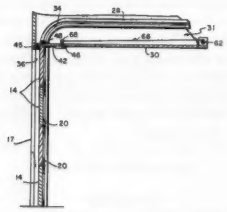
stem valve of a tire to be inflated; and
a rotary connector interposed in the third conduit.

3,927,709

OVERHEAD GARAGE DOOR

Wilbur R. Anderson, and Lydia H. Anderson, both of 2405 Nichol Ave., Anderson, Ind. 46011

Continuation-in-part of Ser. No. 379,220, July 16, 1973, abandoned. This application Jan. 2, 1975, Ser. No. 538,184
Int. Cl.² E05D *15/24, 15/38*
U.S. Cl. 160—37 **10 Claims**



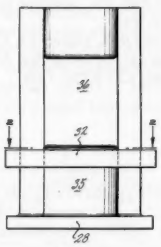
1. A garage door assembly for a garage having a garage opening in one wall and a ceiling, comprising a plurality of panels hingedly interconnected at adjacent edges one on top of the other; first guide means mounted on said interconnected panels at opposed ends thereof; a pair of stationary generally L-shaped tracks each extending vertically along one side of the garage opening through a passage formed in the garage ceiling to a position above the ceiling and then horizontally away from the garage opening, said guide means on said panels being received in said pair of tracks to allow guidable movement of said panels along said tracks between a vertically extending position closing the garage opening and a horizontally extending position above the garage ceiling; a trap door hingedly connected to one of said panels and disposed to substantially close the passage in the ceiling when said panels are in a closed position; and second guide means mounted on said trap door and received in said tracks whereby said trap door is lifted by said panels upwardly out of the passage along said tracks when said panels are moved from a closed position to a open position.

3,927,710

JOINING OF MULTI-SECTION CERAMIC MOLDS

Douglas R. Hayes, Vernon, Conn., and Charles M. Phipps, Ridgewood, N.J., assignors to United Technologies Corporation, Hartford, Conn.

Filed Aug. 21, 1974, Ser. No. 499,224
Int. Cl.² B22C *9/24;* **B22D** *25/06, 33/04*
U.S. Cl. 164—25 **22 Claims**



1. A holding device for use with a multi-part mold for the casting of high temperature metallic alloys, the mold including:
opposed precast ceramic mold sides having projecting mating edge flanges and having recesses therein to form an article cavity, the holding device being
a high strength ceramic ring tightly surrounding the opposed mold sides and engaging the edge flanges to hold the opposed sides together, said ring extending a part only of the length of the mold sides and said ring having a compatible thermal expansion to that of the mold sides.
5. In the attachment of preformed ceramic mold parts together, said mold parts having mating edge flanges, the steps of:
dipping at least a part of the assembled mold elements including a part of the edge flanges in a ceramic slurry of the shell mold type to form a coating in the form of a ring thereon;
drying the coating; and
repeating the dipping and drying until a holding ring of the desired thickness is obtained.

3,927,711

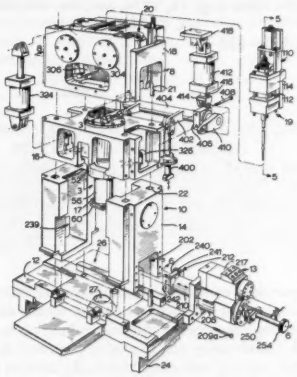
HIGH PRESSURE DIE CASTING APPARATUS

William Frederick Fisher, and Timothy Brian Hodgson, both of Peterborough, Canada, assignors to Fisher Gauge Limited, Peterborough, Canada

Filed Jan. 31, 1974, Ser. No. 438,420
Int. Cl.² B22D *17/12, 17/26*
U.S. Cl. 164—303 **10 Claims**

9. In pressure die casting apparatus, a device for moving and releasably locking a die part to close a die mounted on a die frame, comprising:
a main cylinder having a closed chamber and an hydraulically actuated piston reciprocally operable in the chamber, the piston having a piston rod carrying a die part mount;
an auxiliary cylinder having a closed chamber and an hydraulically actuated piston reciprocally operable in the chamber, the piston having a piston rod;
first and second ports opening into the auxiliary cylinder chamber forwardly and rearwardly of the auxiliary piston respectively;
a third port opening through a first passage into the main cylinder chamber rearwardly of the main piston;
a second passage connecting the main cylinder chamber forwardly of the main piston with the auxiliary cylinder

chamber rearwardly of the auxiliary piston;



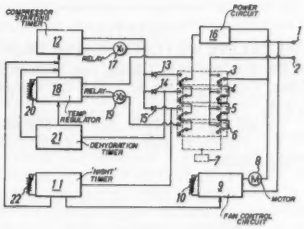
the auxiliary piston rod being constructed and arranged to open and close the first passage on movement of the auxiliary piston forwardly and rearwardly respectively.

3,927,712

ELECTRONIC CONTROL SYSTEM OF AN AIR CONDITIONING APPARATUS

Hiroshi Nakayama, Shizuoka, Japan, assignor to Iwatani & Co., Ltd., Osaka, Japan

Filed Oct. 11, 1974, Ser. No. 514,179
Int. Cl.² F25D 29/00
U.S. Cl. 165—12 **8 Claims**



1. A control system for an air conditioning apparatus having a compressor and fan comprising:

compressor relay means for activating the compressor,

compressor starting timer circuit means connected to the compressor relay means for controlling the duration of operation of the compressor,

temperature regulating circuit means connected to said compressor starting timer circuit means for controlling the compressor operation in response to a sensed temperature,

dehydration timer circuit means connected to said temperature regulating circuit means and said compressor starting timer circuit means for controlling said compressor according to a timed cycle,

power circuit means, and

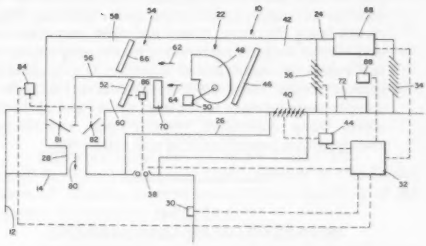
switch means for connecting said power circuit means to said compressor starting timer circuit means, said temperature regulating circuit means and dehydration timer circuit means.

3,927,713

ENERGY RECLAIMING MULTIZONE AIR PROCESSING SYSTEM

Theodore C. Gilles, Marshalltown, Iowa, assignor to Lennox Industries Inc., Marshalltown, Iowa

Filed Oct. 4, 1974, Ser. No. 512,100
Int. Cl.² F24F 3/00
U.S. Cl. 165—16 **10 Claims**



1. A system for processing a volume of indoor air in an enclosure, said enclosure having at least a first and second thermal zone, said indoor air in said first and second thermal zone having a first and second zone temperature, respectively, said first zone temperature exceeding said second zone temperature, comprising, in combination:

thermostatic means for sensing said first and second zone temperatures, said thermostatic means having a predetermined cooling threshold and a predetermined heating threshold;

multizone air processing means for producing a first stream of cooling supply air having a first stream temperature and a second stream of heating supply air having a second stream temperature, said multizone air processing means including air heating means having a power input and air cooling means including evaporator means, compressor means and first condenser means, said air heating means and said first condenser means communicating directly with said second stream, said thermostatic means regulating said first and second air stream temperatures according to said first and second zone temperatures, respectively;

outdoor air duct means for supplying a first quantity of outdoor air having an enthalpy to said multizone air processing means, said outdoor air duct means including outdoor air damper means for regulating said first quantity;

return air duct means for supplying a second quantity of indoor air to said multizone air processing means, said return air duct means including return air damper means for regulating said second quantity;

first means for monitoring said enthalpy of said outdoor air, said first means having a predetermined enthalpy threshold;

second means for monitoring said power input to said air heating means, said second means having a predetermined power threshold; and

means for controlling said multizone air processing means, said outdoor air damper means and said return air damper means in response to said thermostatic means, said first means and said second means, said outdoor air duct means and said return air duct means cooperatively defining means for supplying a quantity of intake air to said multizone air processing means, said intake air being a mixture of outdoor and return air and having a predetermined intake temperature, said controlling means being operable in a first state whenever said first zone temperature exceeds said cooling threshold and said enthalpy exceeds said enthalpy threshold, a second state whenever said first zone temperature exceeds said cool-

ing threshold and said power input exceeds said power threshold, and at least a third state whenever said first zone temperature exceeds said cooling threshold, said enthalpy threshold exceeds said enthalpy and said power threshold exceeds said power input, said air cooling means, said outdoor air damper means and said indoor air damper means being operative, closed and open, respectively, in said first state, said air heating means cooperating with said first condenser means in said first state to process said second stream, said air cooling means, said outdoor air damper means and said return air damper means being operative, closed and open, respectively, in said second state, said air heating means cooperating with said condenser means in said second state to process said second stream, said air cooling means, outdoor air damper means, return air damper means and air heating means bieng inoperative, variably open, variably open and operative, respectively, in said third state.

3,927,714
HEAT EXCHANGER ARRANGEMENT

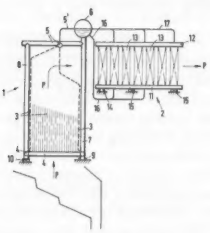
Heinz Stogmuller, Greifensee, Zandbuel, Switzerland, assignor to Heinrich Vorkauf, Berlin, Germany

Filed Feb. 3, 1975, Ser. No. 546,421

Claims priority, application Germany, Feb. 1, 1974, 7403348

Int. Cl.² F28F *5/00*

U.S. Cl. 165—82 **6 Claims**



1. A heat exchanger arrangement comprising:

a. a support having two vertically spaced portions;

b. a first heat exchanger section including

1. an upright frame mounted on the lower one of said portions, and

2. a plurality of heat exchange tubes supported on said frame, respective outer faces of said tubes jointly defining a first part of a passage for a fluid heating medium;

c. a second heat exchanger section mounted on the higher one of said portions and including a plurality of hollow heat exchange elements having respective outer faces jointly defining a second part of said passage for flow of said medium through said second section in a predetermined direction;

d. a horizontally elongated collector vessel mounted on said frame;

e. a plurality of first conduits connecting said tubes to said vessel; and

f. a plurality of second, yieldably resilient conduits connecting said elements to said vessel to permit differential thermal expansion and contraction of said sections.

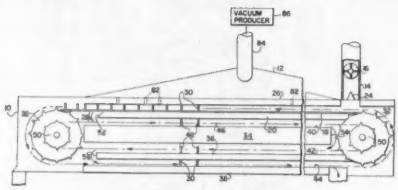
3,927,715
MULTIPLE DECK DRYING APPARATUS

Alder F. Castanoli, 1424 Fifteenth St., Huntington, W. Va. 25701

Filed Aug. 16, 1974, Ser. No. 498,029

Int. Cl.² F28F *7/00*

U.S. Cl. 165—120 **5 Claims**



1. Apparatus for subjecting a material to indirect heat exchange comprising an enclosed casing, means defining a plurality of closed chambers containing a heat exchange medium disposed in said casing and spaced in a vertical direction from each other, each of said chambers being defined in part by an upper impervious deck along which the material being treated moves, said decks preventing direct contact between the material thereon and the heat exchange medium in said chambers, endless conveyor means having an upper pass disposed adjacent to a deck of one of said chambers and having a lower pass disposed between and adjacent the upper deck of another of said chambers and a lower impervious bottom of the superadjacent chamber, said endless conveyor means including a plurality of transversely extending blades spaced therealong, said blades being positioned to move the material along said decks, means for introducing a material to be treated onto one end of the uppermost deck, means to transfer material from a deck onto the next lower deck, means to discharge treated material from the lower deck, and means for maintaining a vacuum in said casing to exhaust vapor emanating from said material.

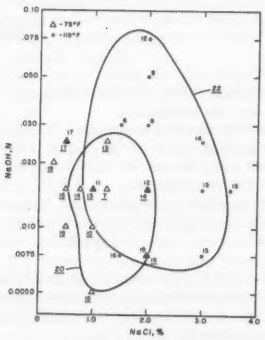
3,927,716
ALKALINE WATERFLOODING PROCESS

Ralph F. Burdyn; Harry L. Chang, and William R. Foster, all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 25, 1974, Ser. No. 508,965

Int. Cl.² E21B *43/22, 43/27*

U.S. Cl. 166—270 **10 Claims**



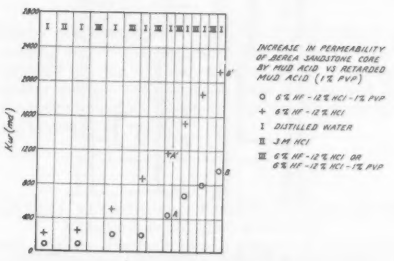
1. In the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems and containing oil having an acid number of at least 0.167, the method comprising:

a. introducing into said reservoir via said injection system an aqueous alkaline solution in an amount within the range of 0.15 to 0.65 pore volume, said alkaline solution having a pH within the range of 11.5 to 13 and a monovalent salt salinity within the range of 0.5 to 2.0 weight percent,
b. thereafter introducing into said reservoir via said injection system an aqueous flooding medium to displace oil to said production system, and
c. recovering oil from said production system.

3,927,717
SECONDARY RECOVERY PROCESS UTILIZING POLYVINYLPYRROLIDONES

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 20, 1973, Ser. No. 427,002
Int. Cl.² E21B *43/26*
U.S. Cl. 166—271 **7 Claims**


INCREASE IN PERMEABILITY OF BEREA SANDSTONE CORE BY MUD ACID VS RETARDED MUD ACID (1% PVP)
O 6% HF - 12% HCl - 1% PVP
+ 6% HF - 12% HCl
I DISTILLED WATER
II 3M HCl
III 6% HF - 12% HCl OR 6% HF - 12% HCl - 1% PVP
Kw (md)

1. A process for recovering hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components and having at least one injection well and at least one production well penetrating the said formation in fluid communication, which comprises displacing through the formation of a slug of a composition comprising an acidic aqueous polymer solution, thereafter injecting a slug of an aqueous drive fluid into the formation to drive the said polymer solution through said formation toward said production well and recovering hydrocarbons through the production well, said aqueous polymer solution comprising of from about 5 to about 12 percent by weight of a mineral acid selected from the group consisting of hydrochloric and sulfuric acid, from about 3 to about 7 percent by weight of hydrofluoric acid and having dissolved therein from about 0.5 to about 5 percent by weight of a vinylpyrrolidone polymer and wherein prior to the introduction of the acidic aqueous polymer solution there is first injected into the formation via said at least one injection well a slug of an aqueous solution containing about 2.5 to about 10 percent by weight of a fluorine-containing salt selected from the group consisting of (A) fluorides of the formula:

$$MF,$$

wherein M is selected from the group consisting of NH_4^+ and Li^+ and (B) acid fluorides of the formula:

$$MHF_2,$$

wherein M has the same meaning as described above.

3,927,718
SECONDARY RECOVERY METHOD

Jack F. Tate, and Jim Maddox, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

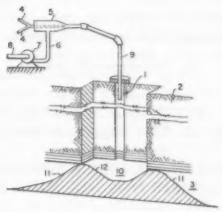
Filed Dec. 26, 1973, Ser. No. 428,486
Int. Cl.² E21B *43/22, 43/27, 43/26*
U.S. Cl. 166—271 **14 Claims**

1. A method for the recovery of hydrocarbons from a hydrocarbon-bearing formation containing acid-soluble components having at least one injection well and at least one production well penetrating the said formation and a fluid communication, which comprises displacing through the formation and aqueous acidic solution of 0.5 to 15% by weight of a non-oxidizing mineral acid and from about 0.0005 to about 1% by weight of an admixture therein, and recovering hydrocarbons through the production well, said admixture being formed from about one part by weight of (A) a member selected from the group consisting of a sulfated/sulfonated polyethoxy alkyl phenol containing from about 8 to about 14 carbons atoms in the alkyl group and from about 4 to about 10 ethoxy groups, the corresponding alkali metal and ammonium salts and mixtures thereof, with (B) from about 1 to about 3 parts by weight of a member selected from the group consisting of a C_8–C_{14} alkyl benzene sulfonic acid, the corresponding alkali metal and ammonium salts and mixtures thereof.

3,927,719
REMOTE SEALING OF MINE PASSAGES

Kenneth R. Maser, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 25, 1975, Ser. No. 572,496
Int. Cl.² A62C *1/00, 3/02;* **E21F** *15/08;* **E21B** *33/13*
U.S. Cl. 169—46 **6 Claims**



1. A method for remotely constructing a seal in a mine passage which comprises:
drilling a borehole from the surface to intersect the mine passage,
pneumatically injecting dry fly ash in dilute phase down said borehole to form a partial plug of fly ash within said mine passage, said plug obstructing more than 90% but less than 99% of the area of said passage and having a crater-like depression below said borehole, and
thereafter injecting an expanding foam into said crater-like depression to fill the depression and to complete the seal.

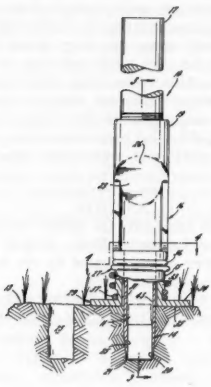
3,927,720
LAWN PLUGGER

Erwin I. Rauch, 1431 Monticello Lane, Rockford, Ill. 61107

Filed Mar. 20, 1974, Ser. No. 452,743
Int. Cl.² A01B *1/24*
U.S. Cl. 172—22 **10 Claims**

1. A hand-operated lawn plugger including an elongated, generally cylindrical body member, a hollow punch member connected to and extending downwardly from the lower end of said body, a foot telescoped over the lower end portion of said punch member and having a generally flat undersurface extending outwardly from adjacent said punch in a generally radial direction, said foot being slidable upwardly relative to said punch member as the latter is thrust by hand into the lawn to remove a plug of earth, and spring means fastened to one of said members and said foot and acting therebetween so as to urge said foot against the lawn and having sufficient

strength to provide an upward thrust to said plugger as to withdraw the punch substantially from the lawn so the plugger



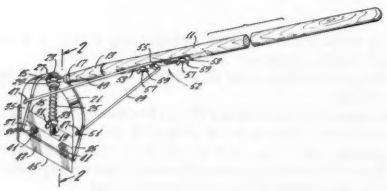
may be bounced in a rhythmic, reciprocating manner from place to place in the lawn to remove successive plugs of earth.

3,927,721

ADJUSTABLE WEEDING HOE

Alden D. Coppock, 1207 Peppertree Lane, Fallbrook, Calif. 92028

Filed Feb. 13, 1974, Ser. No. 442,047
Int. Cl.² A01B *1/08, 1/22;* B25G *1/02, 3/38*
U.S. Cl. 172—371 **4 Claims**



1. An implement for scraping the surface of the ground, comprising:

an elongate handle having an axis;

a blade including an edge designed to scrape the surface of the ground, said blade lying substantially in a plane;

means connected to one end of said handle for mounting said blade for pivotal movement about an axis perpendicular to the axis of said handle, said mounting means including guiding means for guiding movement of said one end of said handle in a direction toward and away from said blade, said guiding means including a spring for biasing said handle in a direction away from said blade;

a stabilizing arm having one end pivotally connected to said blade at a point removed from said pivotal axis; and

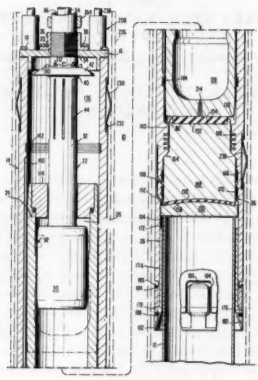
means for selectively pivotally connecting the other end of said stabilizing arm to said handle at a plurality of positions along the axis of said handle for adjusting the angle between the plane of said blade and the axis of said handle.

3,927,722

PILE DRIVING MOVING CYLINDER HAMMER WITH VALVED, FIXED PISTON

Leonard L. Frederick, 15 Crestview Terrace, Whippany, N.J. 07981

Filed Feb. 8, 1974, Ser. No. 440,861
Int. Cl.² E02D *7/10*
U.S. Cl. 173—125 **21 Claims**



1. A pile driving hammer, comprising in combination:

a. an elongated housing member;

b. piston means;

c. closure plate means;

d. means mounting said closure plate means to one end of said housing member, said closure plate means including means for mounting said piston means thereto so that said piston means extends into said housing member and means for connecting the hammer to a device for supporting the hammer during use;

e. elongated ram means displaceable relative to said piston means;

f. load receiving anvil means, said ram means defining an internal space into which is received a portion of said piston means which extends into said housing member for defining therewith a loading chamber and a firing chamber which alternately receive from said piston means a pressurized working fluid for loading and then firing said ram means against said anvil means; and

g. means mounting said anvil means to said housing member at a point thereof longitudinally displaced from said closure plate means, with said ram means being supported by said anvil means when said ram means is at rest.

3,927,723

APPARATUS FOR DRILLING HOLES UTILIZING PULSED JETS OF LIQUID CHARGE MATERIAL

James M. Hall, Gaithersburg, Md., and Louis L. Clipp, McLean, Va., assignors to Exotech, Incorporated, Gaithersburg, Md.

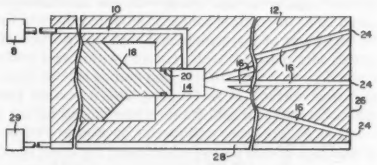
Continuation of Ser. No. 153,582, June 16, 1971. This application June 11, 1973, Ser. No. 368,984
Int. Cl.² E21B *7/18*
U.S. Cl. 175—422 **9 Claims**

1. Apparatus for drilling holes comprising:

a housing with a first end and a second end and having a longitudinal bore passing therethrough and having at least one acceleration bore passing thereinto from said housing second end and at an angle with respect to the housing longitudinal axis and having at least one longitudinal groove extending the length thereof;

first means for generating a pulsed jet of charge material for passage through the at least one acceleration bore;

a pressurized gas source adjacent said housing first end and coupled to the longitudinal bore for impelling material from said housing second end through the longitudinal groove to the housing first end



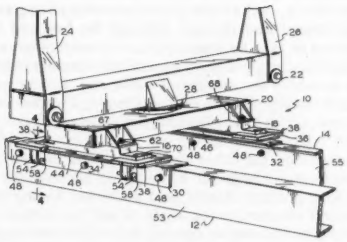
whereby as a hole is drilled in a formation adjacent said housing second end by pulsed jets of charge material expelled out the at least one acceleration bore, spent charge material and formation chips are impelled from the hole through the longitudinal groove for discharge at the housing first end.

3,927,724

LOAD CELL RETAINING APPARATUS FOR ON-BOARD VEHICLE WEIGHING SYSTEMS

Charles J. Baker, Portland, Oreg., assignor to Royal Industries, Inc., Pasadena, Calif.

Filed Feb. 26, 1975, Ser. No. 553,132
Int. Cl.² G01G *19/08, 21/10*
U.S. Cl. 177—136 **11 Claims**



1. Apparatus for retaining an electronic load cell on the frame of a load carrying vehicle in an on-board weighing system in said vehicle, which comprises in combination:

a supporting base on said vehicle frame defining an upwardly facing, generally horizontally extending base surface for supporting said load cell;

a load cell;

a rigid load cell mounting plate fixed to a bottom portion of said load cell having a generally horizontally extending bottom surface adapted for normally resting on said base surface to support said load cell thereon; and

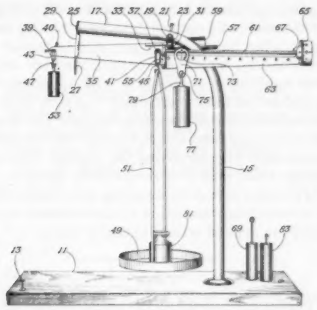
retainer means operatively arranged between said supporting base and said mounting plate permitting vertical and lateral movement of said mounting plate by a predetermined amount relative to said supporting base but positively restraining said plate from movement beyond said predetermined amount.

3,927,725

MULTIPLE WEIGHT SYSTEM WEIGHING MACHINE

Daniel R. Wood, 2832 Willing Ave., Fort Worth, Tex. 76110

Filed Mar. 24, 1975, Ser. No. 561,043
Int. Cl.² G01G *23/14, 1/18*
U.S. Cl. 177—171 **8 Claims**



1. A weighing machine comprising:

a stand;

a fulcrum carried by the stand in a selected vertical plane;

a beam carried by the fulcrum;

a weight carriage carried by the beam on one side of the fulcrum;

a poise carried by the beam on the opposite side of the fulcrum, said poise being movable along the beam;

conversion means supported by the beam to enable variation of the weight of the poise to correspond to other weight systems;

a graduated scale affixed to the beam on the side of the fulcrum opposite the weight carriage and having its zero in said vertical plane;

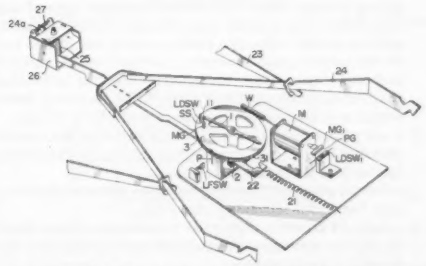
the beam having its resultant center of gravity in said vertical plane while the poise is at zero.

3,927,726

DIGITAL DISPLAY TYPE WEIGHING APPARATUS

Masanao Hanado, Kawasaki; Kensi Takamoku, Shimoigusa; Tsutomu Miyoshi, and Shien Tsai Jeng, both of Tokyo, all of Japan, assignors to Tanita Corporation, Tokyo, Japan

Filed June 13, 1974, Ser. No. 478,868
Claims priority, application Japan, June 18, 1973, 4*d*-68886; Sept. 5, 1973, 48-99295
Int. Cl.² G01G *7/00*
U.S. Cl. 177—213 **15 Claims**



1. A digital display type weighing apparatus comprising: a pointer movable proportionally to applied weight, a control member attached to said pointer, a motor having a shaft, a disk rotatable by said motor shaft upon actuation of said

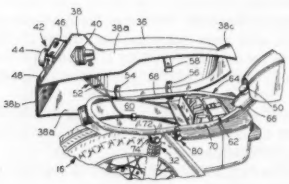
motor, a servo-sensor connected to said disk and oriented thereon with respect to said control member such that said servo-sensor is rotatable from and to a position opposite said control member, circuitry connecting said motor and said servo-sensor and including means for energizing said motor, and means for short-circuiting said motor to thereby stop the same, said control member actuating said short-circuiting means when said control member is in said position opposite said servo-sensor, said control member actuating said energizing means when said control member is moved from said position whereby, when said control member moves in response to application of weight to said apparatus said motor rotates said motor shaft and thereby said disk until said servo-sensor reaches again said position opposite said control member and is stopped, and contactless means cooperating with said motor shaft for converting the number of revolutions of said motor shaft into a corresponding number of electric pulses, a counter circuit for counting said pulses, and a digital display for receiving the output of said counter circuit and for displaying the applied weight in digital form.

3,927,727

VEHICULAR SEAT AND FAIRING ASSEMBLY

Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry Inc., Somersville, Conn.

Filed Apr. 17, 1974, Ser. No. 461,604
Int. Cl.² B62D *61/02*; B60R *11/06*
U.S. Cl. 180—30 **3 Claims**



1. A two-wheeled vehicle such as a motorcycle comprising:

a. a frame;

b. a pair of wheels supported on said frame for rotation relative thereto;

c. motor means supported on said frame operatively connected to at least one of said pair of wheels for imparting drive thereto and thereby to the vehicle;

d. electrical power supply means supported on said frame;

e. a fairing movable between a first position and a second position relative to said frame, said fairing including a top surface, a pair of side surfaces depending from said top surface, each of said pair of side surfaces having an edge thereof attached to an edge of said top surface, a rear surface depending from said top surface, said rear surface having an edge thereof attached to another edge of said top surface and another pair of edges thereof attached each to another edge of a corresponding one of said pair of side surfaces, said top surface, said pair of side surfaces and said rear surface cooperating together to provide therebetween an enclosure capable of receiving therewithin at least a portion of one of said pair of wheels;

f. a seat operable as a support for the driver of the vehicle, said seat being rigidly mounted on said top surface of said fairing for movement therewith;

g. a license plate assembly supported on said rear surface of said fairing for movement therewith;

h. a taillight assembly supported on said rear surface of said fairing for movement therewith in spaced relation to said license plate assembly;

i. electrical conductor means having one end thereof connected in circuit relation with said taillight assembly and the other end thereof connected in circuit relation with said electrical power supply means, said electrical conductor means being operable to permit electrical current to be drawn from said electrical power supply means and transmitted therethrough to said taillight assembly for powering said taillight assembly electrically, said electrical conductor means being flexible so as to permit relative movement to occur between said taillight assembly and said electrical power supply means;

j. hinge means pivotably mounting said fairing to said frame of the vehicle for movement between said first position thereof relative to said frame wherein said fairing is located so as to position said seat mounted thereon for use by the driver of the vehicle and with said portion of said one of said pair of wheels received within said enclosure formed by said top surface, said pair of side surfaces and said rear surface of said fairing and a second position thereof relative to said frame wherein said fairing is located so as to expose and render accessible said portion of said one of said pair of wheels and the other operating components housed below the fairing, said hinge means including a pair of hinge assemblies supported in spaced relation on said frame of the vehicle, each of said pair of hinge assemblies comprising a link having one end attached to said frame of the vehicle and a pivot pin extending outwardly from one side of said link adjacent the free end of said link substantially at right angles to the major axis of said link, said pivot pin of one of said pair of hinge assemblies extending outwardly of said link thereof in a first direction and said pivot pin of the other of said pair of hinge assemblies extending outwardly of said link thereof in the opposite direction, said hinge means further including a pair of members supported from the inside of said top surface of said fairing in spaced relation relative to each other, each of said pair of members including means provided at the free end thereof cooperable with said pivot pin of one of said pair of hinge assemblies to establish a pivotal connection therebetween; and

k. latching means cooperatively associated with said fairing and said frame of the vehicle operable for locking said fairing to said frame when said fairing is in the first position thereof, said latching means including a pair of members supported in spaced relation on said frame of the vehicle, each of said pair of members having an opening formed therethrough adjacent the free end thereof located so as to be aligned relative to each other, a spring biased latching pin positioned in said openings in said pair of members for movement between a locking position and a release position relative thereto, a washer received on said spring biased latching pin, a coil spring enveloping said latching pin having one end bearing against said washer and the other end against one of said pair of members operable for biasing said latching pin to the locking position thereof, and a member having one end thereof attached to the inside of said top surface of said fairing and having an opening formed therethrough adjacent the free end thereof operable for receiving the tip of said latching pin therewithin to lock said fairing relative to said frame of the vehicle.

3,927,728

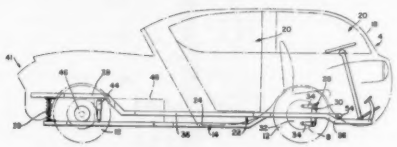
SUSPENSION SYSTEM FOR ELECTRICALLY POWERED VEHICLE

Roy O. Reime, San Jose, Calif., assignor to Richard Dorst, Atherton, Calif.

Continuation-in-part of Ser. No. 157,132, June 28, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 403,131
Int. Cl.² B60K *11/18*
U.S. Cl. 180—60 **8 Claims**

1. An improved electric car of the type having electric motor means for driving traction wheels of the car, the motor means operating in a continuously alternating motor mode and generator mode for conserving energy, the car comprising a horizontal main frame having forward and aft ends, at least two traction wheels mounted directly to the main frame adja-

cent its aft end; means rigidly mounting the motor means to the main frame; electric storage batteries operatively coupled to the motor means and rigidly mounted to the main frame; means pivotally securing a passenger compartment to the main frame adjacent the forward end thereof, the pivot means permitting relative pivotal movements of the compartment at least about a horizontal axis which is perpendicular to a longitudinal axis of the car; spring means resiliently supporting a portion of the compartment on the frame and disposed adjacent the aft end of the main frame; and steering wheels for the



car mounted adjacent the forward end of the main frame; the combined weight of the main frame and of components rigidly mounted thereto substantially exceeding the weight of the compartment and components spring mounted to the main frame to minimize the surging of spring mounted car weight during driving maneuvers of the car and to facilitate the instantaneous deceleration of unspring weight in phase with the operation of the motor means in their generator mode to thereby maximize the recovery of electric energy from kinetic energy of the car when the car decelerates.

3,927,729

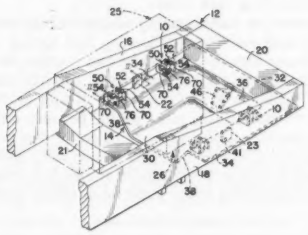
APPARATUS FOR DETACHABLY MOUNTING AN ENGINE BELLY GUARD TO A VEHICLE MAIN FRAME

Albert Gianessi, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 416,731, Nov. 19, 1973, Pat. No. 3,874,624. This application Jan. 20, 1975, Ser. No. 542,322

Int. Cl.² B62D *25/20*

U.S. Cl. 180—69.1 **7 Claims**



1. Apparatus for detachably mounting an engine belly guard to the bottom of a vehicle main frame, which belly guard has a bolt receiving opening therethrough disposed in spaced relation adjacent a generally upright sidewall of such main frame, comprising:

an elongated bolt upwardly extendable through said bolt receiving opening of the belly guard and positionable in retaining engagement thereagainst;

a connector nut having a threaded bore screw threadably engageable with said bolt;

means for mounting said connector nut to said sidewall of the main frame which effectively retains the connector nut against rotation about its threaded bore to facilitate the threaded engagement of the bolt for assembly therewith and which allows limited movement of the connector nut in directions other than the rotary movement about its threaded bore to permit the proper axial alignment of the connector with the bolt; means forming a generally rectangularly shaped, axially tapered opening through said belly guard; and

a generally rectangularly shaped shear block secured to the main frame and having a tapered end portion extending therebelow for close mating receipt within said tapered opening of the belly guard so that relatively large horizontal loads imparted on the belly guard are transmitted through the shear block to alleviate shearing forces on the bolt.

3,927,730

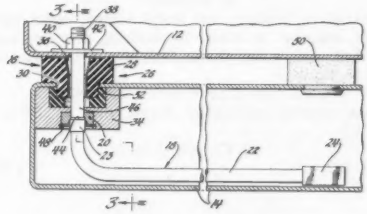
VEHICLE BODY DECELERATOR I

Gerald R. Winslow, Royal Oak, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 9, 1974, Ser. No. 504,147

Int. Cl.² B60R *21/02*; **B62D** *23/00*

U.S. Cl. 180—82 R **8 Claims**



1. An automotive vehicle assembly comprising: a body, a supporting frame, a block of elastomeric material supporting said body on said frame, a rod and anvil interconnecting said body and said frame to urge said body against said block and said block against said frame whereby said block may absorb energy as said body and said frame move toward one another, said rod extending through said anvil to a free terminal end downstream of said anvil, said rod having an enlarged cross section downstream of said anvil, said rod having a bend therein downstream of said anvil, the end of said rod opposite to said free end and upstream of said anvil having a retaining nut threadedly disposed thereon to place said rod in tension between said retaining nut and said anvil to urge said body against said block and said block against said frame so that said rod will be pulled through said anvil to absorb energy as a result of a force moving said body away from said frame.

3,927,731

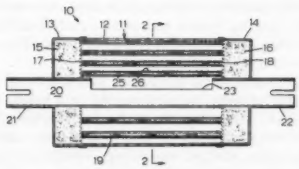
MUFFLER WITH SPIRAL DUCT AND DOUBLE INLETS

Arthur Lancaster, Winnipeg, Canada, assignor to James B. Carter Limited, Winnipeg, Canada

Filed Apr. 10, 1974, Ser. No. 459,840

Int. Cl.² F01N *1/08*

U.S. Cl. 181—58 **3 Claims**



1. Apparatus for silencing an engine and the like, the apparatus comprising:

a generally cylindrical housing disposed about a longitudinal axis and having two opposed end walls and a circumferential side wall;

two opposed inlets for conveying exhaust gases into said housing, said inlets being positioned at respectively opposite ends of said housing on a common axis substantially coincident with said longitudinal axis of the housing;

a spiral duct in said housing, said spiral duct having an inlet at the centre of the said duct and an outlet at the outer periphery of said duct, said spiral duct having an axis positioned substantially coincident with the longitudinal axis of the housing, and said spiral duct inlet being in communication with the said housing inlets through said end wall; and,

an outlet for conveying exhaust gases from said housing, said outlet being disposed at said circumferential side wall of the housing and communicating with said spiral duct outlet.

3,927,732
SCAFFOLD

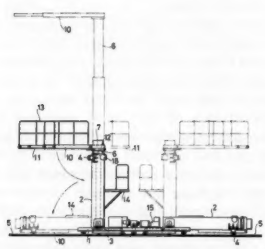
Takayuki Ooka, Ichihara, and Shinji Aihara, Osaka, both of Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo and Osaka Jack Mfg. Co., Ltd., Osaka, both of, Japan

Filed Apr. 1, 1974, Ser. No. 456,875

Claims priority, application Japan, Apr. 5, 1973, 48-41274[U]

Int. Cl.² E04G *1/22*

U.S. Cl. 182—36 **1 Claim**



1. A movable scaffold system, comprising:

a movable supporting truck having a flat truck bed;

telescopic jack means having a lower section and at least one upper section, said lower section being pivotably mounted on said truck bed for pivoting about a horizontal axis between an upright position and a horizontal position, and erecting means on said bed for controlling said pivoting, said at least one upper section being telescopable into said lower section and said lower section having track-engaging means secured to said lower section for supporting said lower section on a track when said truck is moved along said track;

said jack means in its horizontal position lying along said bed with its upper side extending to a height no greater than that of the highest part of the remainder of said system not supported on said jack means, and having an overhanging portion extending beyond an end of said truck; and

foldable scaffold means mounted to said upper section of said jack means and pivotable between a horizontal position when said jack means is upright and a folded horizontal position beneath said overhanging portion of said jack means and between said track-engaging means when said jack means is horizontal.

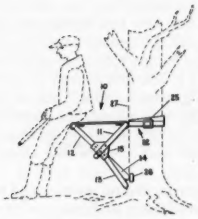
3,927,733
OUTDOORSMAN'S FOLDING CHAIR

Isadore T. Wurn, 436 Ruddiman Drive, and Louis J. Seguin, Box 5092, both of North Muskegon, Mich. 49445

Filed May 24, 1974, Ser. No. 473,202

Int. Cl.² A47C *9/10*

U.S. Cl. 182—187 **6 Claims**



1. In a portable sportsman's seat having a plurality of generally U-shaped frame members each having a base portion and a pair of legs extending therefrom, said frame members being pivotally mounted at the legs thereof, and a flexible seat surface stretchable between the base of an adjacent pair of said frame members; the improvement comprising:

a pair of bracket members rigidly secured to the legs of a first frame member, each said bracket member having a base portion and an elongated channel formed along one side of said base portion, said leg of said first frame member extending generally perpendicular to said base;

means for mounting said legs of second and third of said frame members in said channel of said bracket member, said second and said third frame members being pivotable between a first position generally parallel to and in abutment with said first frame member and a second position extending generally parallel to said channel in opposite directions from each other;

locking means in said mounting means and said second and third frame members for locking said second and said third frame members in said second position; and

means pivotally mounting said legs of a fourth one of said frame members to the other side of said bracket, said fourth frame member being pivotal between a first position generally parallel to said first frame member, a second position generally parallel to said third frame member, and a third position parallel to said first frame member and extending in the opposite direction therefrom.

3,927,734
SKYSCRAPER ESCAPER

Eugene J. Brunette, 237 Christiana Drive, Marrero, La. 70072, and Nathaniel D. Trosclair, 1151 Avenue D, Westwego, La. 70094

Filed Oct. 24, 1974, Ser. No. 517,751

Int. Cl.² A62B *1/20*

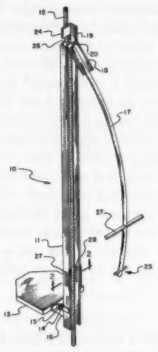
U.S. Cl. 182—193 **8 Claims**

1. Skyscraper Escaper means comprising:

a. an elongated member shaped to house cable means which extends therethrough along its longitudinal axis and provided with a slot along its length through which the cable means passes;

b. elongated bowed hand brake means pivotally connected at one of its ends to said elongated brake member in a spaced apart relationship adjacent to said slot provided therein so as to provide a clamping action upon the cable means passing therethrough and its other end being operably attached to said elongated member during a de-

scending operation whereby pressure upon said elongated bowed hand brake means releases the clamping action



exerted upon the cable means; and

c. seat means operably attached to said elongated member.

3,927,735

MAGNET SYSTEM FOR USE IN THE CONTACTLESS GUIDANCE OF A MOVING VEHICLE

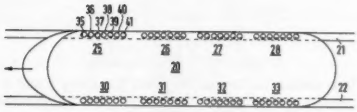
Jurgen Miericke, Nurnberg, and Laxmikant Urankar, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 24, 1974, Ser. No. 517,590

Claims priority, application Germany, Nov. 7, 1973, 2355697

Int. Cl.² B61B *13/08*

U.S. Cl. 104—148 MS **6 Claims**



1. A magnet system for the contactless guidance of a vehicle moving along a track, comprising a plurality of individual magnets connected to the vehicle and disposed one behind the other in the travel direction, wherein the improvement comprises a plurality of individual magnets each of which is approximately of circular cross-section with the total plurality of magnets divided into groups, with all individual magnets in a group disposed one behind the other and having the same current direction such that each group forms a magnet unit having a magnetic field corresponding approximately to that of a single, elongated rectangular magnet.

3,927,736

DISC BRAKE FOR A BICYCLE AND LIKE VEHICLE

Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed Feb. 20, 1974, Ser. No. 444,093

Claims priority, application Germany, Feb. 23, 1973, 2308909

Int. Cl.² B62L *1/00*

U.S. Cl. 188—26 **3 Claims**

1. A disc brake for a bicycle and like vehicle having a frame and a wheel mounted on said frame for rotation about an axis, said brake comprising:

a. a brake disc having an axis of rotation and two radially extending contact faces;

b. first securing means for coaxially securing said disc to said wheel for joint rotation;

c. a support;

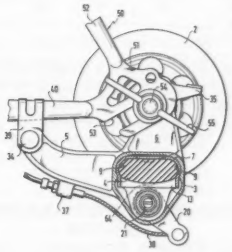
d. second securing means for releasably securing said support to said frame in an operative condition;

e. a brake shoe holder of substantially U-shaped cross section mounted on said support for movement in the direction of the common axis of said disc and said wheel in said operative condition,

1. said brake shoe holder having two flange portions and a web portion connecting said flange portions which extend from said web portion in a direction away from said common axis,

2. said web portion being formed with a slot,

3. said disc passing through said slot with little clearance so as to limit said movement of said brake shoe holder relative to said support in said operative condition,



4. a portion of said disc projecting through said slot in a direction away from said common axis in said operative condition of the support;

f. two brake shoes,

1. said portions of said brake shoe holder jointly enveloping a portion of each brake shoe,

2. respective parts of said brake shoe holder constituting guide means slidably engaging said brake shoes for movement of the engaged brake shoes relative to said brake shoe holder toward and away from a braking position,

3. said brake shoes, when in said braking position, receiving said projecting portion of said disc axially therebetween and frictionally engaging said contact faces when said support is in the operative condition; and

g. brake actuating means on said support for moving said brake shoes toward and away from said braking position.

3,927,737

ANNULAR DUAL PISTON BRAKE ARRANGEMENT

Peter F. M. Prillinger, Peoria Heights, and Paul C. Rosenberger, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 11, 1974, Ser. No. 522,390

Int. Cl.² F16D *65/16*

U.S. Cl. 188—106F **10 Claims**

1. An annular dual piston brake arrangement for selective holding engagement of a rotatable member of a drive train, comprising;

a support structure;

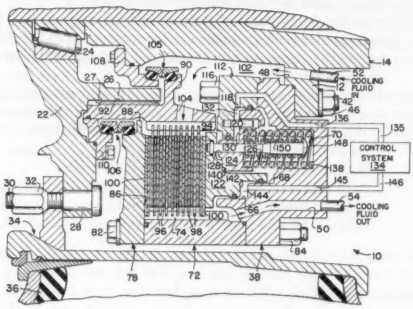
an annular service brake piston axially reciprocably and nonrotatably mounted within said support structure;

fluid actuating means for biasing said annular service brake piston concentrically toward a brake holding position with respect to such rotatable member;

an annular secondary brake piston axially reciprocably and nonrotatably mounted within said support structure in

axially telescoping, substantially radially aligned compact relation within said service brake piston;

fluid retracting means for holding said secondary brake piston in a disengaged condition, limitedly axially separated from said service brake piston; and



spring engagement means for biasing said secondary brake piston directly axially against said service brake piston for subsequent peripheral brake holding engagement of said rotatable member in the absence of a predetermined pressure in said fluid retraction means.

3,927,738

LOAD DEPENDENT ACTING BRAKE FOR CONVEYOR DEVICES

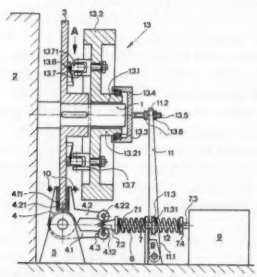
Werner Ernst, Rotkreuz, Switzerland, assignor to Inventio Aktiengesellschaft, Hergiswil, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,604

Claims priority, application Switzerland, Nov. 2, 1973, 15493/73

Int. Cl.² B60T *8/16*

U.S. Cl. 188—187 **2 Claims**



1. A load dependent acting brake for a conveyor device, comprising a drive shaft provided for the conveyor device, a brake disk secured to said drive shaft of said conveyor device, brake lever means cooperating with said brake disk, at least one brake jaw mounted at said brake lever means, said brake jaw including a brake clamp, a brake rod cooperating with said brake lever means, a fixed bearing in which the brake rod is displaceably guided, a brake wedge secured to an end of the brake rod, brake spring means operatively engaging at the brake wedge and bearing against said fixed bearing, said brake spring means exerting a force upon said brake wedge secured to the brake rod for pressing said brake jaw against said brake disk, a brake vent device operatively connected with said brake rod, said brake jaw being in operative co-action by means of said brake rod with said brake vent device, said brake vent device in its switched-in state for venting the brake retracting the brake rod against the action of said brake spring means and said brake vent device in its switched-off state pressing the brake lever means and said brake jaw through the action of the force applied by the brake spring means upon the brake wedge of the brake rod into a brake closing position, a mechanically acting deceleration feeler device effective at the brake lever means, an adjustment lever rotatably mounted at the fixed bearing and cooperating with said brake rod, a disk secured to said brake rod, a prestressed pressure spring disposed between the fixed bearing and the brake vent device, said prestressed pressure spring bearing at said disk secured to the brake and exerting a force upon the adjustment lever, said adjustment lever acting by means of said prestressed pressure spring upon said brake rod, said mechanically acting deceleration feeler device cooperating with said adjustment lever in order to move said adjustment lever through a path substantially proportional to the deceleration occuring at the drive shaft of the conveyor device in the sense of reducing the braking force exerted by the brake jaw upon the brake disk.

3,927,739

DEVICE FOR MOUNTING RAIL-BRAKE MAGNETS

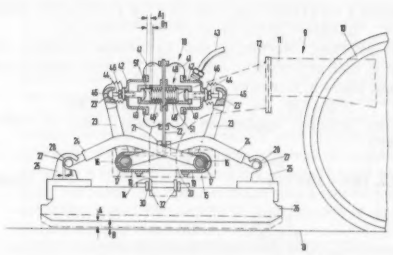
Ernst Katzer, and Pierre Baronnet, both of Munich, Germany, assignors to Knorr-Bremse GmbH, Munich, Germany

Filed Dec. 9, 1974, Ser. No. 531,189

Claims priority, application Germany, Dec. 8, 1973, 2361312

Int. Cl.² F16D *65/34*

U.S. Cl. 188—206 R **6 Claims**



1. In a device for mounting from a railway truck a pair of rail-brake magnets above the wheels, the combination of a pair of pressure medium actuated bellows means for acting in opposite directions, a pair of first lever arms acted upon by said bellows means, a pair of parallel pivotable torsion bars extending transversely of the rails and a said first lever arm attached rigidly to each of said bars, two pairs of second lever arms and each pair attached rigidly to said torsion bars on either side of said bellows means at an angle to said first lever arms and each second lever arm having a free end, one of said rail magnets being supported at the free ends of each pair of said second lever arms, said bellows means moving the brake magnets between a lower ready brake position and an upper rest position and including spring means to retain said brake magnets in the ready brake position.

3,927,740

BRAKE DISK WITH TAPERED KEY WAY

Robert L. Zarembka, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

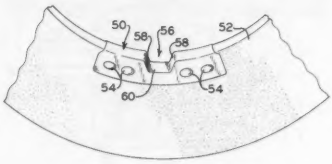
Filed July 1, 1974, Ser. No. 484,411

Int. Cl.² F16D *65/12*

U.S. Cl. 188—218 XL **1 Claim**

1. A brake disk made from a carbon based material having a plurality of evenly spaced slots formed around one periphery thereof, the slots, in the plane of the disk, having a bottom edge and two sides oblique thereto at an angle between 10° and 30°, and

a plurality of reinforcement clips fixedly secured to said disk at said slots, the clips having slots therein congruent with the sides of the slots of the disk and aligned therewith, said clips comprising a first side member adjacent to one side of the disk, a second side member adjacent to the other side of the disk, two cap members interconnecting

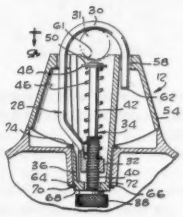


each of the side members on each side of the slot and extending therefrom substantially the full length of the clip, and facings interconnecting the side members and cap members within the slot of the clip to effect encapsulation of the carbon based material in the area of the clip, the clip being everywhere in flush contacting relation with such carbon based material.

3,927,741
LATCHING MECHANISM FOR PORTABLE SECURITY CONTAINER

Morton K. Rubinstein, 14954 Corona Del Mar, Pacific Palisades, Calif. 90272

Filed Dec. 9, 1974, Ser. No. 531,180
Int. Cl.² A45C *13/18*
U.S. Cl. 190—61 **19 Claims**



1. A latching mechanism for a portable container of the type including an interior cavity that is enclosed by exterior walls and which is accessible through a door hingeably attached to said walls, and a latching mechanism for being affixed to an external fixture to prevent removal of said container therefrom, said latching mechanism comprising:

means for engaging an external fixture by being draped across said fixture, said means including:

a retractable hooking member for engaging said fixture and including a base ring having an interior threaded portion, and

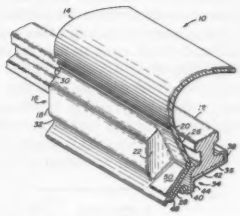
an anchoring bolt to which said hooking member is movably connected, said bolt including a threaded portion with which said base ring is adapted to be threadably engaged,

jaw means for providing a receiving surface against which said fixture can be clamped by said hooking member, said jaw means having walls forming a central cavity in which said anchoring bolt is seated, said retractable hooking member extending from said central cavity and being partially retractable therefrom, said jaw means having a base portion that is movably attached to said container to permit swiveling thereof with respect to said latching mechanism.

3,927,742
THIRD RAIL COVER BOARD

Clarke Reynolds, 535 Hillary Drive, Tiburon, Calif. 94920, and Richard J. Quigley, 2221 Via Maderos, Los Altos, Calif. 94022

Filed Oct. 23, 1974, Ser. No. 517,081
Int. Cl.² B60M *1/04*
U.S. Cl. 191—30 **7 Claims**



1. A cover for an electrified third rail, comprising

a. an electrically insulative cover board which is elongated in the direction of the longitudinal axis of such a rail and includes a top wall having a lateral cross sectional shape which is arcuate with the concavity thereof facing the top of such a rail and a side wall contiguous with said top wall; said side wall including

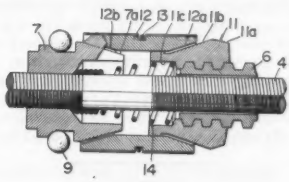
1. a pair of generally upstanding portions,
2. an arcuate portion with the convexity thereof facing the side of such a rail and located between said upstanding portions, and
3. a pair of supportive wall portions each extending from a respective edge of said arcuate portion to the edge of a respective one of said upstanding portions; and

b. means for attaching said arcuate portion to such a rail.

3,927,743
COASTER BRAKE FOR A BICYCLE

Kimihiro Tsuchiye, Sakai, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed May 28, 1974, Ser. No. 473,832
Claims priority, application Japan, May 31, 1973, 48-62211; Nov. 13, 1973, 48-127985
Int. Cl.² F16D *67/02*
U.S. Cl. 192—6 R **5 Claims**



1. A coaster brake hub for a bicycle comprising:

a. a hub shell,

b. a fixed member comprising a fixed hub shaft penetrating through the center of said hub shell and a brake cone which is located at one side internally of said hub shell and fixedly mounted to said hub shaft, said brake cone having an outer tapered face thereon,

c. a driving means at the other side internally of said hub shell and mounted to said hub shaft in a rotatable relation therewith, said driving means fixedly supporting a sprocket wheel of a bicycle to the same,

d. a cylindrical clutch cone, with an outer tapered face, screwably engaged with said driving means for transmit-

ting the rotary force from the driving means to said hub shell during normal rotation of said driving means,

e. a plurality of brake shoes having two inner tapered faces which are frictionally engagable with said tapered faces of said brake cone and said clutch cone respectively, and

f. a coil-shaped clutch spring mounted between said fixed member and said clutch cone so as to apply a given rotary resistance to said clutch cone during reverse rotation of said driving means, said clutch spring having lengthwise one end connected to the outer periphery of one of said fixed member and said clutch cone and having lengthwise the other end connected to the other one of said fixed member and said clutch cone so that during normal rotation of said driving means said lengthwise one end of the clutch spring becomes slidable and the other end becomes fixed, and, during reverse rotation of said driving means, said lengthwise one end of the clutch spring becomes fixed and the other end thereof becomes slidable under the effect of torque in excess of a given amount.

3,927,744

CAGE FOR OVERRUNNING ROLLER CLUTCH

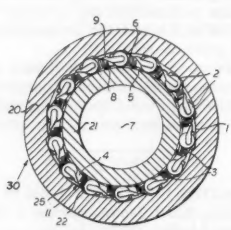
Karl Josef Hallerberg, Plankstadt, Germany, assignor to Borg-Warner, GmbH, Heidelberg, Germany

Filed Aug. 27, 1974, Ser. No. 501,106

Claims priority, application Germany, Sept. 6, 1973, 2344960

Int. Cl.² F16D *41/06*

U.S. Cl. 192—45 **8 Claims**



1. A cage for an overrunning roller clutch having an energizing spring for each roller, said cage including an annular side plate having axially extending tabs bent from the inner and outer rims thereof, an inner and outer tab together with a respective energizing spring providing retaining means for a roller, characterized in that the length (L) of said inner tab (**8**) corresponds approximately to the length (**1**) of a roller (**2**) and that said inner tab (**8**) has a lug (**12**) disposed on a center portion (**24**) thereof for mounting an energizing spring (**3**), said lug extending radially with respect to said annular side plate, and in that said outer tabs (**9**) are provided with legs (**16**) bent over at their ends which form guiding supports for the rollers (**2**) extending parallel to side plate (**4**).

3,927,745

TRACTION SYSTEM

Aaron C. Johnson, Ovid, Mich., assignor to Alfred E. Weekley, Birch Run; John Hatfield, Davison and Floyd Jones, Flint, all of, Mich., part interest to each

Filed May 23, 1974, Ser. No. 472,599

Int. Cl.² F16D *41/00, 13/18*

U.S. Cl. 192—49 **9 Claims**

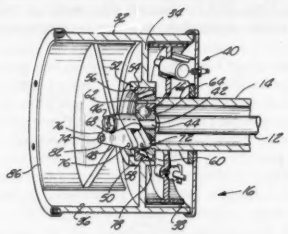
1. A traction system for a wheeled vehicle comprising:

a. an axle having a brake drum rotatably mounted on each end thereof, and

b. for each brake drum:

1. a fulcrum eccentrically journalled on the axle, and

2. a pair of clutch shoes interconnected to the fulcrum, the clutch shoes being free-falling, only one of the pair of clutch shoes being engageable by the fulcrum, at any one time, to drive a wheel associated therewith, the



engageable shoe being determined by the direction of rotation of the wheel.

3,927,746

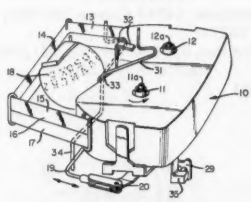
TYPING AND CORRECTING CARTRIDGE FOR SINGLE-LEMENT TYPEWRITERS

William H. Wolowitz, 6905 Persimmon Tree Road, Bethesda, Md. 20034

Filed Apr. 3, 1974, Ser. No. 457,532

Int. Cl.² B41J *35/14, 33/54*

U.S. Cl. 197—151 **6 Claims**



1. A ribbon cartridge for use with a typewriter that employs a ribbon vibrator throw control that has a plurality of control positions, comprising

a casing adapted to be placed in operative relation to a typewriter,

said casing containing a two-color ribbon, one color being located above the other, said ribbon extending out of the casing and then extending back into the casing, and

adjusting means mounted on the casing for engaging said throw control and exercising control over it to enable the selection of either of two of said control positions.

3,927,747

PRINTING MACHINE IN WHICH THE RIBBONS IN TWO DIFFERENT CARTRIDGES MAY BE SELECTIVELY USED

William H. Wolowitz, 6905 Persimmon Tree Road, Bethesda, Md. 20034

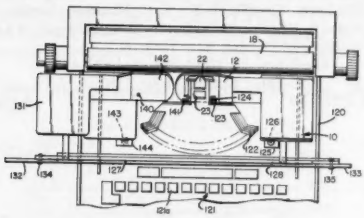
Filed Apr. 1, 1974, Ser. No. 457,293

Int. Cl.² B47J *30/14*

U.S. Cl. 197—151 **20 Claims**

1. In a printing machine adapted to receive an object to be printed, first and second separate printing mediums, first and second cartridge elements respectively supporting, mutually exclusively one from the other, said first and second separate printing mediums, a printing device operable to perform a printing operation by causing at least a portion of a printing medium to be moved from a given location and to contact the object to be printed, means for retaining a first and second socket means in spaced relation to each other, said first socket means carrying said first cartridge element to position its printing medium at said given location, and said second socket

means carrying said second cartridge element and operable to move said second cartridge element to enable the printing medium of said second cartridge element to be moved to said



given location and means operable such that when said second cartridge element is so moved the said first cartridge element is moved to move its printing medium away from said given location.

3,927,748

ATTACHMENT FOR CONVERTING A STANDARD TYPEWRITER TO A SELF-CORRECTING TYPEWRITER

William H. Wolowitz, 6905 Persimmon Tree Road, Bethesda, Md. 20034

Filed May 16, 1974, Ser. No. 470,476
Int. Cl.² B41J *29/16*
U.S. Cl. 197—181 **8 Claims**

1. An attachment device for use with a typewriter of the type that has a keyboard, a backspace means and a ribbon selector, comprising first and second keys including control means for operating said backspace means of the typewriter when either of said first or second keys is depressed, and movable means which when said first key is depressed positions said ribbon selector in a first position and which when said second key is depressed positions said ribbon selector in a second position, and frame means for attaching said device to the typewriter to position the device external to the typewriter in a position such that said control means is in operative relation to said backspace means and said movable means is in operative relation to said ribbon selector.

3,927,749

APPARATUS FOR SUPPLEMENTING THE OPERATION OF THE RIBBON SELECTING AND BACKSPACING MEANS OF A TYPEWRITER

William H. Wolowitz, 6905 Persimmon Tree Road, Bethesda, Md. 20034

Filed Aug. 12, 1974, Ser. No. 496,602
Int. Cl.² B41J *29/16*
U.S. Cl. 197—181 **8 Claims**

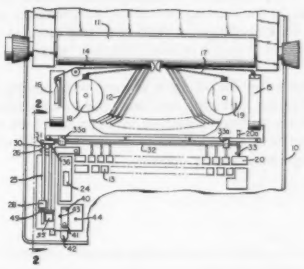
1. In a printing machine,

printing means including a printing medium having first, second and third printing fields,

selecting means for selecting which of said three printing fields will be used at any particular time,

said selecting means being movable in first and second opposite directions and having at least first, second and third positions to which it is movable, one for each of said ribbon fields, the second one of said three positions being a mid-position and the other two positions being in said first and second opposite directions respectively from the mid-position,

said printing means including operable means for performing the printing operation in steps across the object being printed and including backspace means for backspacing the operable means one step,



a first key for moving said selecting means in said first direction to said first position to select one of said three fields,

means for operating said backspace means when said first key is depressed, and

means for selecting either said second or said third position of said selecting means, said means comprising a second key for moving said selecting means in said second direction

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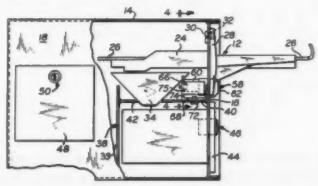
3,927,750

LOCKABLE COIN SLIDE ASSEMBLY

Harry Greenwald, Whitestone, and Salvatore Iglio, Richmond Hills, both of N.Y., assignors to Walter Kidde & Co., Inc., Clifton, N.J.

Filed Dec. 5, 1973, Ser. No. 421,843
Int. Cl.² G07F *9/00*
U.S. Cl. 194—97 R **2 Claims**



1. A lockable coin slide assembly comprising:

a. a housing including an outer wall having an opening therein;

b. a coin slide mechanism mounted on said housing;

c. said mechanism including a coin slide reciprocally mounted for projected and retracted movement through said outer wall opening;

d. said mechanism further including a face plate engageable with said wall in the mounted position thereof and covering said outer wall opening, said plate having an opening therein;

e. lock means mounted through said plate opening, said lock means including a locking shaft extending through said outer wall opening, and a locking shaft operating means accessible from the exterior of said housing and actuable by a key;

f. said locking shaft being selectively rotatable by said key received in said locking shaft operating means;
g. a bracket supported within said housing;
h. said bracket comprising an upstanding rear leg portion and a pair of upstanding side leg portions, said rear leg portion being spaced from said outer wall, and each one of said pair of side leg portions being connected to a separate side of said rear leg portion and projecting forwardly in substantially abutting relation to said outer wall;
i. selectively operable complementary formed engaging means on the rear leg portion of said bracket and on said shaft for engaging said shaft with said bracket upon rotation by said key for locking said mechanism on said housing;
j. said housing including a second wall having an access opening for servicing said coin slide mechanism; and
k. blocking means positioned between said lock means and service wall for preventing access to said locking shaft through said service opening.

3,927,751

PIN GUIDE FOR PRINTING HEAD

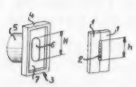
Claude-Michel Juvet, Les Brenets, Switzerland, assignor to Seitz S.A., Les Brenets, Switzerland

Filed July 5, 1974, Ser. No. 486,199

Claims priority, application Switzerland, July 6, 1973, 9863/73

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **1 Claim**



1. A support for a pin guide, and a head to which said support is secured, said support having a recess therein, a pair of plates cemented in said recess, said plates having opposed edges that define openings between said opposed edges, said support having a cylindrical rear projection that engages in a cylindrical opening in said head, said recess and said plates having a plurality of flat surfaces that are in area contact with each other and that are perpendicular to the axis of said cylindrical rear projection, said recess and said plates having further flat surfaces that are in area contact with each other and that are parallel to said axis, said recess being defined by said flat surfaces thereof, said support and said head having flat surfaces that are in area contact with each other and that are perpendicular to said axis, said support and said head having further flat surfaces that are in area contact with each other and that are parallel to said axis, said further flat surfaces of said support and said head including at least one flat surface on at least one projection that extends forwardly from said head, and a setscrew releasably securing said support in said head.

3,927,752

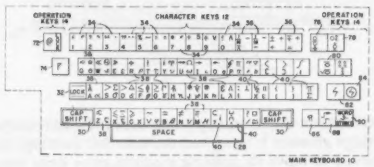
KEYBOARD AND ENCODING SYSTEM FOR PHOTOCOMPOSITION OF SCIENTIFIC TEXT INCLUDING MULTILINE MATHEMATICAL EQUATIONS

Roger W. Jones, Sayville, N.Y.; J. C. Fineman, Louisa, Va., and James R. Roesser, Brookhaven, N.Y., assignors to American Institute of Physics, New York, N.Y.

Filed Jan. 22, 1974, Ser. No. 435,477

Int. Cl.² B41J *5/30, 5/10*

U.S. Cl. 197—19 **10 Claims**



1. A system for typographic composition of scientific text, comprising a keyboard having character keys, a plurality of format keys indicating forms for different mathematical expressions, and two format delineator keys including a separator key for delineating the component parts for a plurality of mathematical expressions represented by said format keys and a terminator key indicative of the end of an expression with one of said formats, and digital means responsive to operation of said keyboard for producing an output in response to any one of said format keys indicating that subsequently keyed characters are to be printed in one location determined by the format represented by said one format key until a separator key strike, if any, whereupon subsequently keyed characters are to be printed in another location according to said format until said terminator key is struck ending the influence on said subsequently keyed characters of the format represented by the immediately preceding format key.

3,927,753

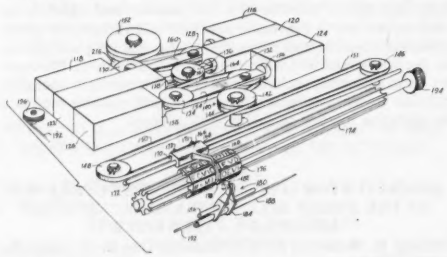
SOLENOID SYSTEM FOR MOVING A TYPE MEMBER

Timothy F. Donovan, Huntington, and William P. Ryan, Bethany, both of Conn., assignors to Mite Corporation, New Haven, Conn.

Filed Aug. 22, 1969, Ser. No. 852,168

Int. Cl.² B41J *1/32*

U.S. Cl. 197—49 **39 Claims**



1. In a printer having a movable type body, a solenoid system to move the type body, said solenoid system comprising a plurality of pairs of opposing solenoids, a plurality of displacement means each operatively connected to a pair of solenoids, said displacement means being movable in a first direction, by one of said solenoids of a pair, to a first position and movable in a second direction, by the other solenoid of said pair, to a second position, said plurality of displacement means having different displacements which are interrelated in a predetermined ratio, means to sum the displacements of said displacement means, and means to transmit the sum of

said displacements to the type body for selection of a position on the type body.

3,927,754

MARGIN STOP ARRANGEMENT FOR TYPEWRITERS

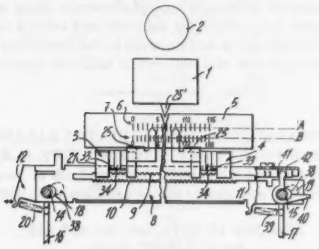
Ulrich Menzi, Yverdon, Switzerland, assignor to Hermes Precisa International S.A., Yverdon, Switzerland

Filed Sept. 18, 1974, Ser. No. 507,251

Claims priority, application Switzerland, Sept. 20, 1973, 13529/73

Int. Cl.² B41J *21/02, 21/18*

U.S. Cl. 197—63 **13 Claims**



1. A margin stop arrangement for typewriter having a type element intended for printing with at least two different spacings between the characters, rack means with at least two different sets of teeth of different pitch, a margin scale carrier graduated with at least two different scales corresponding to the different character spacings, at least one margin stop for cooperating with said sets of teeth, and wherein the improvement comprises that said rack means, has a longitudinal opening, first and second said sets of teeth, each set of a different pitch, being so incorporated in said opening that they face each other; means for vertically moving said margin stop between a first position and a second position, said margin stop in said first position cooperating with the first set of teeth and in said second position with the second set of teeth; and further wherein the scales of said scale carrier include first and second scales, the graduations of which correspond respectively to the pitches of said first and second sets of teeth, said first and second scales being spaced apart a vertical distance proportional to the vertical spacing between the first and second positions of said margin stop, whereby the vertical movement of said margin stop and the vertical spacing between said first moves said indicator an amount equal to second scales enables the typist to read the latter more easily and without confusion.

3,927,755

SORTING APPARATUS WITH ROTATING ARTICLE DIVERTER

Edward W. Ritola, Yacolt, Wash., assignor to Lumber Systems, Inc., Portland, Oreg.

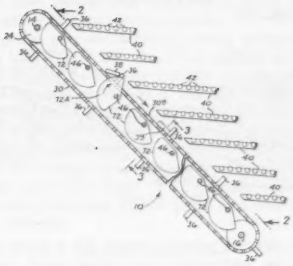
Filed Mar. 6, 1974, Ser. No. 448,491

Int. Cl.² B65G *47/00*

U.S. Cl. 198—25 **17 Claims**

1. Sorting apparatus comprising an elongate conveyor for carrying articles along a path past a plurality of sorting stations spaced apart in the direction of movement for an article along said path, and

diverting means for diverting selected ones of said articles to selected sorting stations, said diverting means comprising a plurality of rotatable cams spaced longitudinally of said path, with one of said cams disposed adjacent each of said sorting stations, a cam having a projecting lobe thereon and being mounted adjacent said path for rotation between a nondiverting position in which said lobe is spaced from said path to permit articles to move therepast on said conveyor and a diverting position in which said lobe projects into said path to engage and divert an article from said path into a sorting station, and operating means for rotating said cam in one rotational direction



from a nondiverting position to a diverting position and thence continuing in said one rotational direction to a nondiverting position spaced from said path.

3,927,756

TRANSFER MECHANISM FOR LONG DRIED FARINACEOUS PRODUCTS

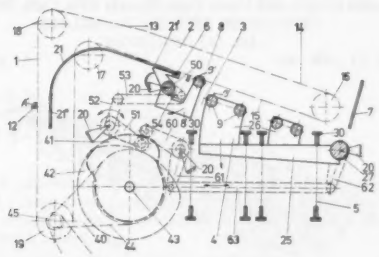
Werner Remund, Uzwil, Switzerland, assignor to Buhler Brothers, Ltd., Uzwil, Switzerland

Filed Sept. 3, 1974, Ser. No. 502,362

Claims priority, application Switzerland, Sept. 5, 1973, 12779/73

Int. Cl.² B65G *47/52*

U.S. Cl. 198—27 **12 Claims**



1. In transfer apparatus for elongated dried farinaceous products wherein the products are transported on rods in a powered rod advancer having an ejection loop where said products are removed from said rods and deposited on a belt conveyor located beneath the said ejection loop by means including a stripping mechanism, with a restraining nose and a stop plate, and a lowering mechanism, the improvement which comprises:

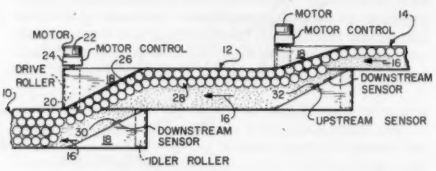
an initial tipping element in said apparatus arranged for movement between a raised position, in which it supports first ends of said products preparatory to removal of said rods, and a lowered position, in which it is displaced out of the path of movement of said products on said lowering mechanism;

and means for individually controlling the movements of said tipping element and said lowering mechanism.

3,927,757
AUTOMATIC CONTROL SYSTEM FOR A MOTOR-DRIVEN CONVEYOR SECTION

Frederick E. Fauth, Baltimore, Md., assignor to American Bottlers Equipment Company, Baltimore, Md.

Filed Oct. 7, 1974, Ser. No. 512,609
Int. Cl.² B65G 43/08
U.S. Cl. 198—37 8 Claims

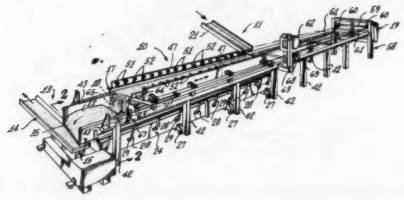


1. An automatic control system for a motor-driven conveyor section, said system comprising: speed control means operatively connected to the conveyor motor drive and responsive to the presence of a first control signal for automatically modulating the velocity of the article conveyor within a range of speeds defined by predetermined upper and lower limits; limit shift means coupled to said speed control means and actuable in response to the presence of a second control signal for automatically adjusting said predetermined upper and lower limits to shift said speed modulation range; first sensing means disposed in a downstream location with respect to the direction of conveyance for sensing an accumulation of articles thereat and generating said first control signal in response thereto; and second sensing means disposed in an upstream location with respect to the direction of conveyance for sensing an accumulation of articles thereat and generating said second control signal in response thereto.

3,927,758
AUTOMATIC MATERIAL-HANDLING APPARATUS

Vaughn Gregor, 465 Castle Place, Beverly Hills, Calif. 90210

Filed July 29, 1974, Ser. No. 492,466
Int. Cl.² B65G 37/00
U.S. Cl. 198—89 17 Claims



7. In an automatic material-handling apparatus for receiving bulk material at a supply station, storing the material for delivery to a using system, and discharging the material at a discharge station, the combination of:

a first elongated storage and discharge conveyor having means for receiving and holding material and for discharging material at a discharge station at one end of the conveyor;

means for operating said first conveyor selectively to discharge material at said discharge station;

a second elongated conveyor mounted for back-and-forth endwise movement in parallel relation with said first conveyor, and having a distributing end movable along substantially the full length of said first conveyor during such endwise movement to distribute material in a layer along substantially the full length thereof;

drive means for moving said second conveyor longitudinally relative to said first conveyor and independently thereof, between a first extreme position in which said conveyors are longitudinally overlapped and said distributing end is adjacent the end of said first conveyor opposite said one end, the range of movement of said second conveyor being less than its full length;

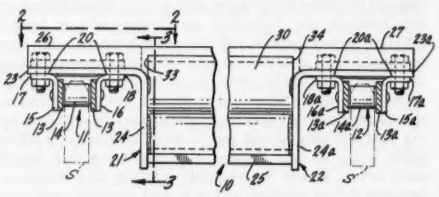
means for supplying material to said second conveyor at the supply station, and located in general longitudinal alignment with said opposite end of said first conveyor and in overlying relation with said second conveyor whereby material can be supplied to the second conveyor in the area where the second conveyor always is in position to receive the material;

and control means for operating said drive means to distribute material from said second conveyor along said first conveyor in a layer from said one end toward the other end thereof, and to add material to the layer from the end thereof opposite said one end of said first conveyor.

3,927,759
FLIGHT ASSEMBLY FOR ACHIEVING BALANCED REACTION FORCES IN ELEVATING-TYPE SCRAPER

John H. Hyler, and Clifford E. Johnson, both of Peoria, Ill., assignors to Westinghouse Air Brake Company, Pittsburgh, Pa.

Filed July 15, 1974, Ser. No. 488,523
Int. Cl.² B65G 19/00
U.S. Cl. 198—171 5 Claims



1. In an elevator for use in an earth moving machine, the combination comprising a pair of endless chains, means for supporting and driving the chains for movement in unison along parallel runs, the chains having respectively paired outer and inner links, at least one pair of such links having means defining aligned, flat platforms parallel to the runs of the chains, a transversely extending flight having bases at its ends in the form of end plates presenting aligned, flat surfaces dimensioned to mate with the platforms for seating thereon, pivot connections on the platforms generally centered thereon and oriented perpendicularly to the runs of the chains for pivotally securing the bases of the flight, a plurality of fasteners in the form of bolts in a two-dimensional pattern for maintaining the bases of the flight seated against the surfaces of the respective platforms, and means providing limited lateral lost motion at the bolts so that when the flight is bowed by striking an obstruction setting up a peak reaction force, the bowing is accommodated by limited free twisting movement of the flight bases relative to the platforms thereby to avoid twisting of the links and insuring equal division of the reaction force between the links of the chains.

3,927,760
CONVEYOR HANGER MODULAR CONSTRUCTION

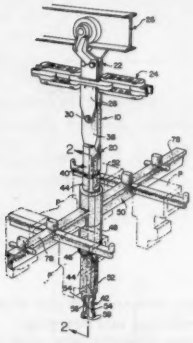
John W. McCall, Birmingham, Mich., assignor to Formall, Inc., Warren, Mich.

Filed Sept. 23, 1974, Ser. No. 508,260
Int. Cl.² B65G 17/20
U.S. Cl. 198—177 T 21 Claims

1. A parts-carrying hanger of modular construction for removable attachment to the clevis of a trolley in a trolley conveyor system, said hanger comprising

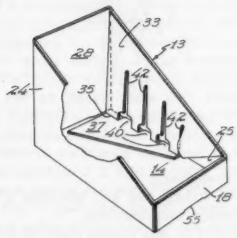
a proximal hanger member having

a proximal end portion adapted to be secured to said trolley clevis by a clevis pin,
an intermediate rod portion,
and a distal end terminating in a first coupling section,
one or more modular hanger members each having
a proximal end terminating in a complementary second coupling section,
an intermediate rod portion,



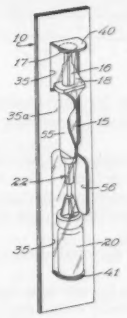
and a distal end terminating in a first coupling section,
each modular hanger member being connected to the next preceding hanger member by their complementary coupling sections and by closure means encircling at least portions of said mated coupling sections,
and one or more parts-carrying members each having
means for attachment to and disposed upon and about each said mated coupling sections,
and one or more parts-supporting arms connected to and extending outwardly from said attachment means.

3,927,761
DISPLAY CARTON
Daniel J. Boyle, Milwaukee, Wis., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.
Filed Nov. 29, 1974, Ser. No. 528,268
Int. Cl.² B65D *5/50*
U.S. Cl. 206—45.14 **6 Claims**



1. A display carton made from foldable paperboard or similar sheet-like material and adapted for holding a plurality of thin rigid articles such as display cards in an upright position, said carton comprising:
parallel front and back panels;
parallel side panels connecting said front and back panels to form a tube-like arrangement;
a bottom panel structure connecting said panels and forming a base therefor;
a pair of liner sections connected to the top edges of said side panels and extending downwardly into said carton, said liner sections having a bottom edge juxtaposed with said bottom panel;
said liner sections having vertical slots formed therein extending to the bottom edges thereof, said slots adapted to retain said rigid articles in parallel, spaced relation;
a section hingedly attached along said bottom edge of each of said liner sections and folded inwardly to lie in flush relationship with said bottom panel;
said hingedly attached sections having outwardly facing spacer tabs connected thereto extending between said bottom edges of said liner sections and said side panels;
a front liner panel formed in size substantially equal to said front panel and hingedly attached to the top edge of said front panel and folded inwardly and downwardly into contact with said front panel; and
a bottom liner hingedly connected to said front liner panel opposite said front panel and positioned in overlapping relationship with said bottom panel structure to serve as a liner therefor.

3,927,762
STACKABLE SYRINGE PACKAGE
Robert C. Zdarsky, Westchester, and Lawrence S. Wysocki, Chicago, both of Ill., assignors to Hoerner Waldorf Corporation, St. Paul, Minn.
Filed Nov. 1, 1974, Ser. No. 519,809
Int. Cl.² B65D *65/02, 71/00, 73/00*
U.S. Cl. 206—45.31 **2 Claims**



1. A paperboard blank for a card package holding a combined syringe having a finger ledge and filler bottle, said syringe arranged with the needle end in contact with said bottle, said blank comprising:
a first panel made of foldable paperboard;
said first panel having an elongated die cut aperture formed therein, said aperture being formed in length substantially equal to said syringe and filler bottle;
said aperture in said first panel being formed in width at its ends sufficient to allow said bottle and said finger ledge on said syringe to pass therethrough;
a first side restraining flap positioned in said aperture and connected along a first fold line parallel to the lateral edges of said aperture, said first fold line defining one edge of a first extended area of said first panel protruding into said aperture, said finger ledge adapted to be positioned adjacent one end of said first flap;
a second side restraining flap positioned in said aperture spaced longitudinally from said first flap and connected along a second fold line parallel to said first fold line, said second fold line defining one edge of a second extended area of said first panel protruding into said aperture along the lateral side opposite said first extended area;
said first and second parallel fold lines spaced apart a distance equal to the diameter of said syringe;

a plastic film covering said aperture and attached to said first panel; and

a second panel hingedly connected to one edge of said first panel substantially equal in size to said first panel.

3,927,763
INSTALLATION UNIT FOR A MULTISTAGE RADIAL COMPRESSOR

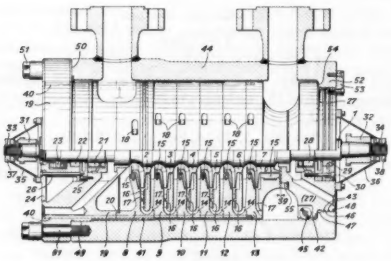
Rene Strub, and John Peter Naegeli, both of Winterthur, Switzerland, assignors to Brown Boveri - Sulzer Turbomachinery Ltd., Zurich, Switzerland

Continuation of Ser. No. 207,308, Dec. 13, 1971, abandoned. This application Aug. 20, 1973, Ser. No. 389,443

Claims priority, application Switzerland, Dec. 15, 1970, 18548/70

Int. Cl.² B65D *85/68*

U.S. Cl. 206—319 **10 Claims**



1. An installation unit for introduction into a casing of a multistage radial compressor comprising

a shaft,

a plurality of rotors mounted on said shaft,

a plurality of annular deflectors disposed about said shaft, sealing means mounted in deflectors about said shaft,

a plurality of annular diffusors, each diffusor mounted in a respective deflector,

a high pressure cover disposed against said deflectors at an inner side thereof,

a bearing in said cover for rotatably supporting said shaft in said cover and centrally within said bearing,

a stuffing box in said cover for sealing said shaft relative to said cover,

a low pressure cover disposed against said deflectors at an opposite side thereof,

a bearing in said low pressure cover for rotatably supporting said shaft therein and centrally within said latter bearing, a stuffing box in said low pressure cover for sealing said shaft relative to said low pressure cover, and

means removably mounted on said covers and said shaft for clamping said covers and said deflectors together and for clamping said shaft to said covers and said deflectors to prevent relative rotation between said shaft, said covers and said deflectors whereby said deflectors are pressed together and said shaft is placed under tension while being held centrally within said sealing means.

3,927,764
STACKING COLLAR FOR WAREHOUSING AND TRANSPORTING SHEET MATERIAL

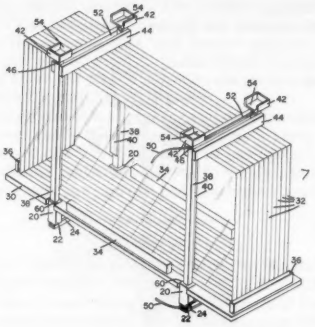
Murray J. Fox, Rte. 1, Pompeo Road, Wilsonville, Conn. 06255

Filed July 30, 1974, Ser. No. 493,175

Int. Cl.² B65D *19/26, 21/02, 85/48*

U.S. Cl. 206—451 **2 Claims**

1. A collapsible collar of the class described comprising a generally flat base, means forming pairs of sockets at certain edges thereof, a stack of sheet material positioned on said base, a pair of separable standards inserted into each said pair of sockets means at the tops of said standards securing the same together including strapping extending completely around said stack of sheet material on the base, under the base, and down along the standards at opposite sides of the base,



braces extending between each pair of standards, means in the braces receiving said strapping,

channel members under the base, each channel being connected at its ends to one of said pair of standards,

and sockets at the tops of the standards adapted to receive the channels of a similar collar stacked thereabove.

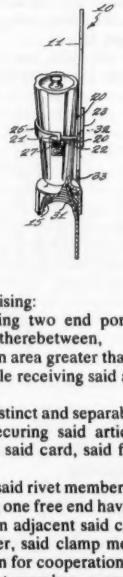
3,927,765
ARTICLE AND CARD PACKAGE AND FASTENING MEANS THEREFOR

Glenn I. Beal, Somerset, Pa., assignor to R. M. Smith, Inc., Somerset, Pa.

Filed Mar. 19, 1974, Ser. No. 452,648

Int. Cl.² B65D *73/00*

U.S. Cl. 206—481 **6 Claims**



1. A package comprising:

a. an article including two end portions with a middle mounting portion therebetween,

b. a display card of an area greater than the outline configuration of said article receiving said article on one surface thereof, and

c. fastening means distinct and separable from said card and said article for securing said article at said mounting portion thereof to said card, said fastening means comprising

i. a rivet member, said rivet member including at least two legs each having one free end having a cam portion and a locking portion adjacent said cam portion, and

ii. a clamp member, said clamp member having at least two holes therein for cooperation with said at least two legs of said rivet member, a camming portion and a locking portion of said clamp member associated with

each said hole, said camming portions of a said clamp member for deflecting said legs by cooperation with said camming portion of said legs,

one of said members when fastening said article to said card having a portion operatively engaging said card, and the other member having a portion engaging said mounting portion of said article, whereby said legs are passed through said holes and are cammed by said camming portions of said clamp member until said locking portions of said legs engage said locking portions of said clamp member thereby fastening said article onto said card.

3,927,766

CUPS FOR HOLDING INGREDIENTS FOR DRINKS

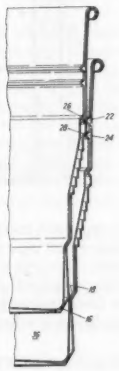
Robert H. Day, Bracknell, England, assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 4, 1974, Ser. No. 439,209

Claims priority, application United Kingdom, Feb. 7, 1973, 6057/73

Int. Cl.² B65D *21/02, 85/72*

U.S. Cl. 206—519 **1 Claim**



1. A double-walled container capable of nesting and interlocking with another identically formed container with a space for storage of a concentrate between the bottom walls of the containers when nested and interlocked, said double-walled container comprising an inner member secured within an outer member, each member being formed of a seamless thin-walled plastics-material and each member comprising a bottom wall and an integral side wall extending generally upwardly and outwardly to the upper end thereof, the inner member including an upper sealing surface spaced from the bottom wall thereof a distance sufficient to provide a space therebelow for storage of a concentrate, the outer member including a lower sealing surface at the junction of the bottom wall and side wall of said outer member, said upper and lower sealing surfaces being inclined to the axis of said container in a direction upwardly and outwardly of said container in a frusto-conical shape and cooperating to make a seal when two such containers are nested, a downwardly facing holding surface formed on said inner member to extend radially inwardly thereof, an upwardly facing holding surface formed in said outer member to extend radially inwardly thereof, said downwardly and upwardly facing holding surfaces formed in the side walls of said inner and outer members above the midheight of said container and with the vertical distance between said downwardly facing holding surface and said upwardly facing sealing surface of said inner member being sufficiently less than the distance between said upwardly facing holding surface and said lower sealing surface of said outer member to produce axial and hoop stresses in the side wall of an inner member between the holding and sealing surfaces thereof of one container and in the side wall of the outer member between the holding and sealing surfaces thereof of another of said containers when nested in said one container with said holding surfaces overlapping each other to interlock said another and said one containers.

3,927,767

PACKAGING UNIT

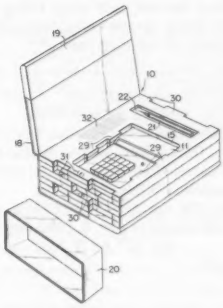
Masatoshi Sato; Katuo Umemura, and Yoshinori Kamata, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 30, 1973, Ser. No. 365,238

Claims priority, application Japan, June 1, 1972, 47-54522

Int. Cl.² B65D *81/16, 85/36*

U.S. Cl. 206—521 **16 Claims**



1. A packaging unit for wrapping an article comprising:

a single plate folded in zigzag fashion so as to form a plurality of superposed leaves;

said leaves being connected with each other along said folded edges;

the intermediate leaves being perforated with first vertically penetrating apertures so as to collectively form a single continuous bore for receiving said article;

the inner wall portion of each leaf defining said apertures being provided with inwardly extending projections spaced from each other for protecting said article from external shocks; and

the outer wall portion of each leaf being notched so as to form outwardly extending projections spaced from each other for additionally protecting said article from external shocks.

3,927,768

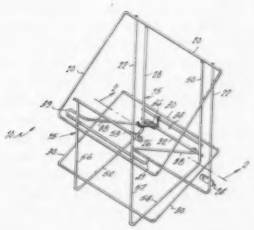
MAGAZINE RACK

Melvin Cohen, 58 Heights Road, Wayne, N.J.

Filed Jan. 8, 1973, Ser. No. 321,733

Int. Cl. A47f *1/06*

U.S. Cl. 211—49 D **1 Claim**



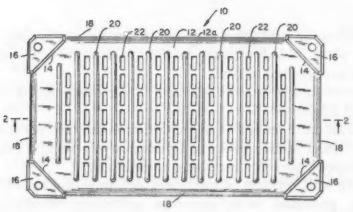
1. A rack comprising a back, upper and lower rectangular wire support members connected to said back and extending

downwardly and forwardly therefrom, said back including an upright U-shaped member having an open end closed by said upper support member, a U-shaped spine open at the top including a pair of rear members extending downwardly from said upper support member and a pair of front members extending upwardly from a pair of members connecting said front and rear members and a connected member connecting said front members, said rear members being attached to the rear of said support members and said front members being attached to the front of said support members, said spine being located inwardly of said rectangular support members, and an upwardly and forwardly extending presser member pivotally connected to said spine at the rear thereof, and spring means for urging said presser member against said spine at the front thereof, said spine including a pair of cross members, said presser member being pivotally mounted on one of said cross members, said presser member being located substantially inwardly of said spine and including two diverging wings at the front thereof, said wings being engageable with said spine, said spring means being disposed on said one of said cross members at one side thereof.

3,927,769
SHELF STRUCTURE

Louis Maslow, deceased, late of Dallas, Tex.; by Frances Maslow, executor, Dallas, Tex., and by Richard Maslow, executor, Wilkes-Barre, Pa., assignors to Metropolitan Wire Goods Corporation, Wilkes-Barre, Pa.

Filed Apr. 29, 1974, Ser. No. 464,916The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.
Int. Cl.² A47F *5/00*
U.S. Cl. 211—153 **10 Claims**

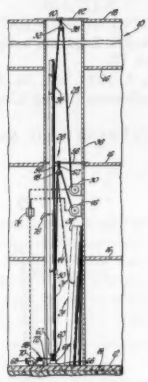


1. A shelf mountable on a shelf support structure, said shelf comprising a substantially flat, one-piece rectangular sheet of material having downwardly depending corner portions, said corner portions at each corner being disposed in a plane substantially normal to a plane defined by said flat sheet; connector means on said sheet for mounting said shelf on the support structure, said connector means including corner connectors at each corner, each connector including a corner structure disposed on one side of a respective corner portion and a clamping bar disposed on an opposing side of the respective corner portion, at least one of said corner structure and clamping bar being provided with a recess dimensioned to receive a corner portion when the latter is clamped between an associated corner structure and clamping bar, surfaces of said corner structure and clamping bar being substantially complementary to each other; fastening means for maintaining each corner structure and associated clamping bar in abutment against each other and against a respective corner portion with the latter being received within the respective recess, said corner structures further being provided with means for mounting the same on a shelf support post, each corner connector defining a substantially closed crevice-free structure which houses a corner portion; a plurality of spaced protuberances projecting above one major surface of said sheet; and a plurality of apertures provided between said spaced protuberances, whereby objects placed on said protuberances are maintained at a level above said one major surface and air is permitted to pass through said apertures and circulate around the objects including along supported surfaces thereof.

3,927,770
APPARATUS TO FACILITATE JOINING PIPE SECTIONS TOGETHER TO FORM A VERTICAL PIPE COLUMN

Janusz J. Rekawek, Clarkston, Mich., assignor to Darel Bennett, Royal Oak, Mich.

Filed Apr. 22, 1974, Ser. No. 462,843
Int. Cl.² B23K *37/04*
U.S. Cl. 214—1 P **8 Claims**



1. A pipe handling apparatus comprising:
means for supporting a first pipe section in a substantially vertical orientation;
means for suspending a second pipe section at a vertical height above the first pipe section, the second pipe section being suspended in a substantially vertical orientation;
means for controlling the relative positions of the first pipe section and the second pipe section such that the pipe sections are abutted end to end while in the vertical orientation and can be joined together; and
means for rotating the first pipe section and the second pipe section about a substantially vertical axis while the second pipe section is abutted to the first pipe section.

3,927,771
LOAD POSITION SENSING AND TIER PATTERN SELECTION FOR A BALE WAGON

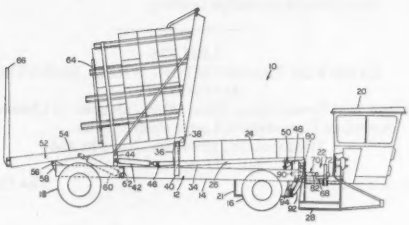
Lee D. Butler, Kingsburg, and Edward J. Wynn, Fresno, both of Calif., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1974, Ser. No. 498,834
Int. Cl.² A01D *87/12*; B65G *57/32*
U.S. Cl. 214—6 B **13 Claims**

1. In a bale wagon having means for accumulating tiers of bales into a stack, means for accumulating bales into a tier, and operable means for forming bales into a plurality of different tier patterns and for adding each tier to said tier-accumulating means, the improvement which comprises:
a memory element for storing a predetermined sequence of said plurality of tier patterns, said memory element defining a plurality of successive-displaced positions which each represent one of said tier patterns and being comprised by a rotatable cam having a peripheral arrangement of lobes which define said plurality of successive positions;
means coupled to said operable means and associated with said rotatable cam, said coupled and associated means

including a cam follower disposed adjacent said cam and engaged with one of said lobes thereof and being responsive to each of said positions defined by said lobes of said cam to cause said operable means to form the bales into the one of said tier patterns corresponding to each of said cam positions and add said tier to said tier-accumulating means; and

means responsive to the addition of each of said tiers of bales to said tier-accumulating for successively disposing said cam follower of said coupled and associated means



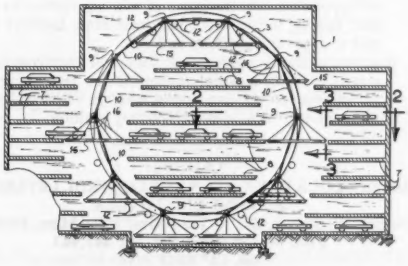
at each of said cam positions, said responsive means including means movably mounted on said tier-accumulating means for supporting said tiers on said tier-accumulating means as said tiers are successively added thereto, said supporting means being moved as at least some of said tiers are successively added to said tier-accumulating means, and means for transmitting the movement of said supporting means to said cam so as to rotate said cam and thereby dispose said cam follower at successive ones of said positions defined by said lobes of said cam.

3,927,772

VEHICLE PARKING AND ROTARY ELEVATOR ASSEMBLY

Hans Borner, 4010 Cote St., Catherine Road, Apt. 14, Montreal, Quebec, Canada

Filed July 10, 1974, Ser. No. 487,255
Int. Cl.² E04H 6/16
U.S. Cl. 214—16.1 BA **5 Claims**



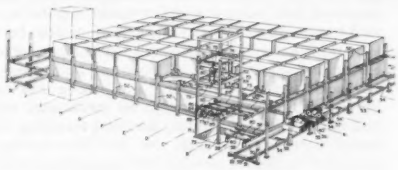
1. A vehicle parking and rotary elevator assembly comprising a pair of axially spaced-apart annular wheel flanges rotatably and peripherally supported for rotation about a common horizontal axis and defining an axial passage at said common axis, each of the wheel flanges including a ring gear having a channel shape cross-section and forming a pair of coaxial cylindrical flanges and gear teeth secured to one coaxial cylindrical flange of each pair of flanges and extending between the corresponding flanges, a pinion gear for meshing engagement with said gear teeth to rotate said elevator assembly, coupling devices transversely interconnecting the wheel flanges and holding the latter in axially spaced parallel relationship relative to each other, and vehicle carriers pivotally suspended to the axially spaced-apart wheel flanges, transversely extending between the latter and displaceable to edgewise registry with any one of a plurality of vehicle parking floors extending into edgewise adjoining relationship relative to the circumferential periphery of said wheel flanges and at different levels relative to the common horizontal axis.

3,927,773

LOAD STORAGE SYSTEM AND APPARATUS THEREFOR

Thomas John Robert Bright, 270 Sandridge Road, Rockcliffe, Ontario, Canada

Continuation of Ser. No. 263,765, June 19, 1972, abandoned.
This application May 21, 1974, Ser. No. 472,055
Int. Cl.² B65G 47/00
U.S. Cl. 214—16.4 C **1 Claim**



1. A load storage and retrieval system including:

A. at least one load transporting route;

B. at least one load storage unit having N storage locations which are formed within a rectangular area accessable from at least two of said load transporting routes;

C. at least N movable supporting members which are arranged in a series of at least two parallel rows;

D. means for circulating said movable load supporting members in a step-by-step sequential manner either clockwise or anti-clockwise, movable in a direction parallel to one axis of said at least one load storage unit, and movable in a direction normal to said axis on carrier members which move simultaneously along said at least one load transporting route on opposite sides of said rectangular area, in either opposite directions to one another or simultaneously in one direction from right to left or left to right, each of said carrier members having the means of imparting lineal movement for any required distance along the load transporting route or one movement at a time in either direction to act as a shuttle for circulating the movable load supporting members with all of said at least one load transporting routes being on one level together with said movable load supporting members with one or more levels as required, with the carrier members also having the means of imparting transverse motion along and back two parallel rows or a series of two parallel rows on one level as a self contained complete operation, or with a series of levels acting independently, there being a total of Y said carrier members, and a maximum of $N + Y - 1$ of said at least N movable load supporting members, the carrier members in every case engaging with a series of equally spaced co-operating members on the floor of each level, such co-operating members being composed of open ended channels and therebeing also open ended channnel one at each corner of each said N movable load supporting member, whereby transverse movement is imparted to one or more of said N movable load supporting members in a row, one at a time, or simultaneously, or where a movable load supporting member sitting astride said carrier member in "piggy-back" fashion is used to push a whole row forward one space at a time in one direction or the other, or two rows at a time moving in opposite directions, but simultaneously; said carrier members performing the dual function of acting as shuttle carriers to circulate said at least N movable load supporting members from side to side

one space or move along and back a load supporting route to any one of a series of adjoining rows, working in parallel; said carrier members being reciprocable along said at least one load transporting route extending in a direction normal to one axis at each end of said rectangular area, each of said carrier members being reciprocable simultaneously along said at least one load transporting routes in opposite directions to one another, or together simultaneously from one row to another by a distance substantially equivalent to the width of a row of storage locations, so as to be aligned alternatively with said parallel rows of movable load supporting members, the arrangement being such that the transfer of a load by any movable load supporting member, to or from said at least one load transporting route, respectively from or to a selected storage location is effected by circulatory movement of the movable load supporting members in conjunction with reciprocatory movement of the carrier members; there being at least one carrier member in each load transporting route and said carrier member being at least twice the width of a movable load supporting member, with integral means of imparting both lineal and transverse travel, with positive and precise indexing in lineal and transverse directions by mechanical means; said movable load supporting members travelling within one or more series of double rows, and never leaving this area until the desired movable load supporting member is required for unloading at a loading and unloading station;

E. locking means for each said row of load storage positions adapted to restrain at least the movable load supporting members at each end thereof against movement along the guideways of said rows;

F. means for releasing said locking means of a given row in respect to at least the movable load supporting member at the adjacent end of said row in response to the movement of a driven carrier member into registry with said adjacent end of said row; and

G. control means for the driven means for said driven carrier members for imposing thereon a selected program of synchronized sequential movements arranged to insert loads presented at a loading position into storage in said load storage positions and to present loads in said load storage positions at a selected one of said unloading stations for removal from said storage unit.

3,927,774

APPARATUS FOR DISCHARGING BULK MATERIAL FROM STORAGE TANKS

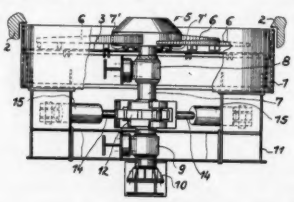
Fritz Teske, Industriestrasse 28, and Lothar Teske, Industriestrasse 30, both of D-505 Porz-Westhoven, Germany

Filed Dec. 24, 1974, Ser. No. 536,212

Claims priority, application Germany, Dec. 28, 1973, 2364830

Int. Cl.² B65G 65/48

U.S. Cl. 214—17 D **12 Claims**



1. In an apparatus for discharging bulk material from storage tanks, including a housing adjoining an open lower end of the storage tank; a housing floor disposed in the housing; means defining a discharge opening in the housing, the discharge opening being eccentric with respect to the housing floor; and an impeller wheel disposed in the housing above the discharge opening, the improvement comprising in combination:

a. a plurality of vanes forming part of said impeller wheel, the clearance between any two adjacent vanes measured along their path of travel being at least approximately equal to the dimensions of said discharge opening measured along said path of travel; and

b. a stepping mechanism for rotating said impeller wheel through angles of predetermined magnitude, said stepping mechanism having means for stopping said impeller wheel in a position in which said vanes are substantially clear of said discharge opening.

3,927,775

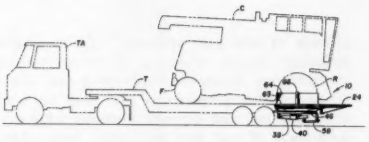
RAMP FOR TRANSPORTING WHEEL MOUNTED MACHINERY

Lloyd Earl Graupmann, Plato, Minn., assignor to Chromalloy American Corporation, Lester Prairie, Minn.

Filed Oct. 29, 1974, Ser. No. 518,464

Int. Cl.² B65G 67/02

U.S. Cl. 214—85 **14 Claims**



1. A ramp for use with a trailer of the type used to transport wheel mounted machinery, the ramp comprising:

a main ramp member having a first end and a top surface and including load bearing means and means for mounting said first end to the trailer for rotation of said main ramp member between a loading position and a transporting position;

receiving ramp means for receiving thereon a wheel of the machinery to be transported, said receiving ramp means having a first end pivotally mounted to said main ramp member below the plane of said top surface and proximate to said first end of said main ramp member and a foot member for contacting the ground to support said receiving ramp means when said main ramp member is in said loading position, wherein said receiving ramp means is supported below the plane of said top surface by said load bearing means when said main ramp member is in said transporting position; and

restraining means cooperating with said receiving ramp means to form a wheel receptacle for restraining the wheel received thereon against rotation when said main ramp member is in said transporting position.

3,927,776

SAFETY LOCK DEVICE FOR THE CONTROL LEVERS OF A FRONT END LOADER

Douglas W. Steiger, Box N, Thief River Falls, Minn. 56701

Filed Mar. 4, 1974, Ser. No. 447,943

Int. Cl.² E02F 3/34

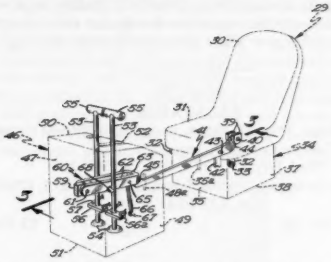
U.S. Cl. 214—140 **7 Claims**

1. A front-end loader vehicle, including a body having ground engaging wheels, power means for driving the wheels, elongate arms pivotally mounted on the body for a vertical swinging movement relative thereto, implement pivotally mounted on the arms for vertical swinging movement relative thereto, a seat pivotally connected adjacent its front end to the body for vertical swinging movement between a raised inoperative position and a lowered operative position in response to a person sitting on said seat, a pair of generally vertically disposed control levers positioned in side-by-side relation forwardly of said seat and each being pivotal in a fore and aft direction, and also pivotal about its vertical longitudinal axis,

to control operation and steering of the vehicle and operation of the arms and implement,

lock engaging means on said levers,

a locking member pivotally connected with said body and being spaced forwardly of said seat for movement relative to said body between locking and released positions, said locking member when in the locking position engaging said locking engaging means to lock the levers against movement, and when in the released position, releasing said levers for movement,



yieldable means engaging said locking member to yieldably urge the locking means towards the locked position and urging the seat to the raised inoperative position, an elongate actuating lever pivotally mounted on said body intermediate its ends and being connected with said seat and projecting forwardly therefrom, said actuating lever engaging said locking member and shifting the same to the released position when the seat is shifted to the lowered position in response to a person sitting on the seat.

3,927,777

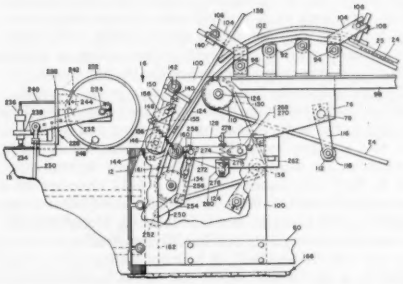
METHOD OF LOADING MAGAZINE WITH CARTONS

Arthur F. Newell, South Weymouth, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.

Division of Ser. No. 253,613, May 15, 1972, Pat. No. 3,831,784. This application Feb. 14, 1974, Ser. No. 442,363

Int. Cl.[2] B65G *60/00*

U.S. Cl. 214—152 **14 Claims**



1. The method of maintaining a horizontal column of stiff prefolded glued cartons in which the cartons rest on one edge faced to back with one end of the column arranged to receive cartons from a prefolding and gluing apparatus from which the cartons are delivered in a horizontal position and the other end arranged to give up cartons to opening and bottom forming apparatus to which cartons are required to be delivered in vertical position, comprising advancing the horizontally disposed cartons from the prefolding and gluing apparatus one carton at a time in uniformly spaced non-overlapping relation upwardly along a relatively gradual slope and then downwardly along a relatively steep slope without bending of the carton as it reverses its direction to present the leading edge into engagement with the rear face of the last carton in the column substantially mid-way between the top and bottom edges at an acute angle to the vertical plane of the last carton in the column, forcing the carton downwardly into facial engagement with said last carton in the column and maintaining the column of cartons substantially constant in length by substantially simultaneously removing a carton from the foremost end of the column and adding a carton to the rearmost end of the column.

3,927,778

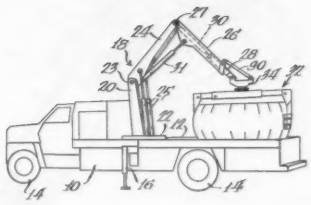
TIRE CHANGING APPARATUS

Francis L. Zrostlik, Garner, Iowa, assignor to Iowa Mold Tooling Co., Inc., Garner, Iowa

Filed Apr. 16, 1973, Ser. No. 351,776

Int. Cl.[2] B65G *7/00*

U.S. Cl. 214—333 **6 Claims**



1. Tire changing apparatus comprising: a motorized boom adapted to be mounted on the bed of a truck or the like, said boom including two pivotally interconnected, elongated arms, one of said arms including at least two relatively movable elements, one of said elements being telescopingly received by the other of said elements, and reciprocal motor means within said other element and connected to said one element for selectively extending or retracting said one element relative to said other element; a tire gripping fixture including at least two opposed tire gripping members movably mounted for movement towards and away from each other to grip the periphery of a tire and hold the same and pivotally connected to said one element for rotation about two mutually perpendicular axes; a link of fixed length pivotally connected to said other element; means pivotally connecting said link to said fixture at a location spaced from the pivotal connection of said fixture to said one element whereby the attitude of said fixture, and thus said tire gripping members, may be selectively altered through selective operation of said motor means to extend or retract said one element within said other element.

3,927,779

CAR TOP CARRIER FOR BOATS AND THE LIKE

Ferris L. Johnson, 14427 Elmport Lane, Poway, Calif. 92064

Filed July 10, 1974, Ser. No. 487,301

Int. Cl.[2] B60R *9/00*

U.S. Cl. 214—450 **2 Claims**

1. A vehicle top-mounted load carrier comprising,

guide rails,

means to mount the guide rails longitudinally on the top of the vehicle,

ramp rails corresponding to said guide rails,

detachable means to mount said ramp rails in registry with said guide rails inclined downwardly from the vehicle top,

a carriage on said guide rails movable along said ramp rails from and to said guide rails and being adapted to carry a load,

hoisting means on said vehicle to hoist said carriage and said load from and to said guide rails on said ramp rails,

longitudinal sides of said carriage riding on said rails,

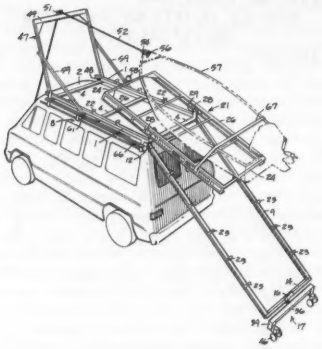
freely pivotable guide means at the end of said guide rails adjacent to said ramp rails,

rollers on said pivotable guide means engageable by said longitudinal sides so that said carriage rides over said rollers whereby said carriage tilts toward and onto said guide rails and toward and onto said ramp rails respectively according to when the center of gravity of said carriage and the load thereon is offset toward said guide rails and toward said ramp rails,

said hoisting means comprising,

a pivoted winch frame pivotable at the ends of said guide rails farthest from said ramp rails,

means to hold said pivoted winch frame in elevated position,



a winch adapted to be secured to the vehicle,

a cable from said winch extending over said winch frame and adapted to be connected selectively either to the adjacent end of said carriage or the adjacent end of said load for hoisting said load and said carriage,

said pivoted winch frame being foldable over the load on said carrier on the guide rails,

and said means to hold said winch frame in position being adjustable from the elevated position of said winch frame to the folded position of said winch frame.

3,927,780

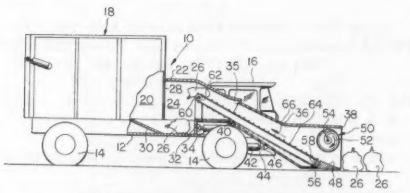
LOADING APPARATUS FOR A COLLECTION VEHICLE

William E. Dearlove, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1974, Ser. No. 511,100

Int. Cl.² B60P *1/36*

U.S. Cl. 214—519 **4 Claims**



1. Refuse collecting apparatus comprising,

a vehicle having a frame, a front end, a rear end, and means defining a refuse accumulating compartment on said frame;

a chute movably mounted on said frame and having an inlet end extending forwardly of said front end and an outlet end in communication with said compartment;

means for moving said chute on said frame to and from a position wherein said inlet end is in substantial abutment with the underlying terrain over which said vehicle may travel whereby said inlet end may be disposed to receive refuse resting on the underlying terrain;

conveying means including a driven endless belt within said chute for engaging refuse adjacent said inlet end and transporting said refuse to said compartment, said belt having a conveying surface provided with a plurality of spikes adapted to puncture plastic refuse containing bags; and

a rotatable, flexible drum mounted in said chute extending transversely across said inlet end, and means for rotating said drum whereby said drum will flexibly urge refuse containing plastic bags or the like against said spikes to be ripped thereby to allow air to freely enter the bags.

3,927,781

EXCAVATOR

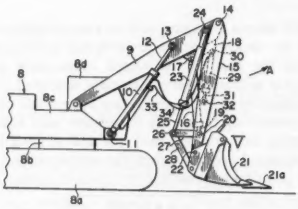
Nobuya Okabe, Ibaraki, Japan, assignor to Hitachi Construction Machinery Co., Ltd., Japan

Filed July 31, 1973, Ser. No. 384,299

Claims priority, application Japan, Aug. 28, 1972, 47-85352

Int. Cl.² B66F *9/00*

U.S. Cl. 214—763 **13 Claims**



1. An excavator of the bucket type comprising an excavator proper including movable body means, rotary body means and swivel body means, boom means pivotally supported at a forward end portion of said swivel body means of the excavator proper for movement between a lying position and an upright position, boom hydraulic cylinder means for moving the boom means, arm means pivotally supported at a forward end of said boom means for oscillating motion, arm hydraulic cylinder means for operating said arm means, bucket means pivotally supported at a forward end of said arm means, bucket hydraulic cylinder means for operating said bucket means pivotally connected through linking means to an end portion of said arm means for moving the bucket means horizontally forwardly away from the excavator proper in oscillating motion, and levelling hydraulic cylinder means connected at one end to the boom means and at another end to the arm means, said levelling hydraulic cylinder means having a first fluid chamber on a piston rod push-out side thereof maintained in fluid communication with a fluid chamber on a piston rod push-out side of the boom hydraulic cylinder means for operating the boom means, said levelling hydraulic cylinder means also having a second fluid chamber on a piston rod pull-in side maintained in fluid communication with a fluid chamber on a piston rod pull-in side of the boom hydraulic cylinder means for operating the boom means whereby the bucket means can be pushed out horizontally forwardly as the arm means is moved in oscillating motion by the action of the arm hydraulic cylinder means.

3,927,782

PLASTIC CONTAINER AND BASE CONSTRUCTION

Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

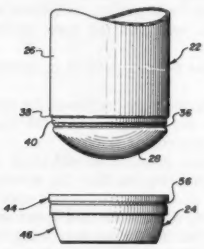
Filed July 2, 1974, Ser. No. 484,631

Int. Cl.² B65D *23/00*

U.S. Cl. 215—100 R **7 Claims**

1. A base made of thin wall and substantially uniform thickness material for round bottomed containers comprising:

bottom panel means having a radially outwardly and upwardly directed shallow frusto-conical shape for substantially circular contact of the radially outward upper edge portion of said bottom panel means with the bottom of a round bottomed container, connecting ring means for coupling said base to a said container; and annular support channel means joining said bottom panel means to said connecting ring means, said annular support channel means comprising substantially radially spaced-apart inner and outer annular channel wall portions and an annular foot portion interconnecting the lower ends of said channel wall portions, said connecting ring means comprising an annular shoulder at the lower end thereof which extends radially inwardly and is integrally connected to the upper end of said outer annular channel wall portion, the radially outward upper edge of said bottom panel means integrally connected to the upper end of said inner annular channel wall portion, said inner channel wall portion having an upwardly converging frusto-conical and radially outwardly convex shape and having a substantially lesser dimension



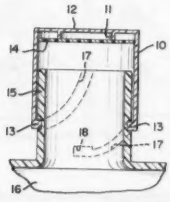
axially of said base than said outer channel wall portion, said outer annular channel wall portion having a radially outwardly continuously curvilinear convex shape and a height sufficient to engage the bottom of a round bottomed container in substantially circular line contact therewith radially outwardly and upwardly of said circular contact of said radially outward upper edge of said bottom panel means with said container, said annular foot portion comprising a substantially flat planar ring with the plane of said ring perpendicular to the axis of said base, coupling means integrally connected to the radially outward edge of said annular shoulder of said connecting ring means for coupling said base to a round bottomed container, whereby the relative radial positioning and axial dimensioning of said bottom panel means and said channel wall portions causes said inner channel wall portion to deform convexly outwardly to a greater degree than said outer channel wall portion under axial loading whereby to insure stable, vertical placement of an assembled base and a round bottomed container.

3,927,783

SAFETY CLOSURE FOR CONTAINERS

Clayton Bogert, 118 Lowell Road, Glen Rock, N.J. 07452

Filed Jan. 28, 1974, Ser. No. 437,071
Int. Cl.² B65D *55/02*
U.S. Cl. 215—222 **6 Claims**



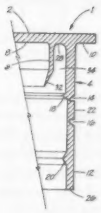
1. A leak-proof safety closure for containers comprising a cap provided with a top and sides and a container having a neck portion, said cap having a protrusion near the bottom of the sides of the cap, said neck being provided with an integral recessed relatively elongated, gradually sloping track having a notch near the terminus of the track adapted to accommodate the protrusion of the cap pressure means disposed below the top of the cap and whereby when said cap is placed on the neck of the container the top of the said protrusion will engage the track and upon rotation of the cap said protrusion is accommodated on said notch under the pressure exerted by said pressure means.

3,927,784

TAMPER-PROOF BOTTLE CAP AND CONTAINER

Ben A. Cochrane, 210 E. Linda Mesa Ave., Danville, Calif. 94526

Filed Feb. 13, 1975, Ser. No. 549,512
Int. Cl.² B65D *49/12, 41/32*
U.S. Cl. 215—256 **7 Claims**



1. A deformable plastic cap comprising (1) a top disk, (2) a cylindrical thin-walled outer skirt integrally attached to and extending substantially perpendicularly from said disk and (3) a cylindrical inner skirt integrally attached to and substantially perpendicular to said disk positioned inward and enclosed within said outer skirt and substantially co-axial therewith and extending for a shorter distance than said outer skirt; said outer skirt scored and weakened along a circumferential first score line downwardly spaced from said disk, and score and weakened along a circumferential second score line spaced downwardly from said first score line to form a weakened cylindrical band within said outer skirt, a tab attached to said cylindrical band and extending from said band and outwardly from said outer skirt, a weakened area extending between said first score line and said second score line immediately adjacent said tab, a narrow radial first bead extending circumferentially around the inside and integrally attached to said outer skirt between said first score line and said disk, and a narrow radial second bead extending circumferentially around the inside and intergrally attached to said outer skirt below said second score line.

3,927,785

ELECTRICAL WIRING BOX STRUCTURE

David W. Kinney, Parkersburg, and William E. Baxter, Walker, both of W. Va., assignors to Union Insulating Company, Parkersburg, W. Va.

Filed Oct. 24, 1974, Ser. No. 517,622
Int. Cl.² H02G *3/08*
U.S. Cl. 220—3.8 **16 Claims**

1. An electrical wiring box structure comprising:

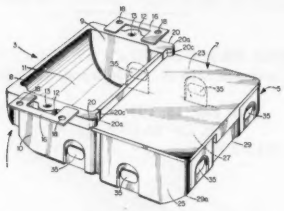
a plurality of walls arranged to form a first box portion having an opening and a second box portion laterally extending from the first box portion and in open communication with the first box portion and having an opening, the second box portion being offset with respect to the first box portion and the opening of the second box portion being offset with respect to the opening of the first box portion;

a retaining member extending from one of the box portions and adjacent to the opening of the second box portion, said retaining member having a confinement surface

spaced from the plane of the opening of the second box portion; and

cover means for the second box portion, said cover means comprising:

a first member covering the opening of the second box portion and having a portion with a thickness approximately equal to the distance between the confinement surface of the retaining member and the plane of the



opening of the second box portion and disposed between the confinement surface of the retaining member and the plane of the opening of the second box portion, said portion of the first member thereby being confined between the confinement surface of the retaining member and the second box portion; and

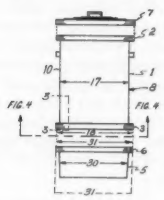
attachment means mechanically and physically securing the first member to one of the walls of the second box portion.

3,927,786

CONTAINERS FOR WASTE FOR USE WITH TRASH BAGS

Fred George Aboud, 3812 Taylorsville Road, Louisville, Ky. 40220

Filed July 11, 1973, Ser. No. 379,544
Int. Cl.² B65D 7/00
U.S. Cl. 220—4 R **2 Claims**



1. For use with replaceable trash bags, a trash container conprising:

A. an upper, vertical support member comprising:

1. an open-ended tubular portion, and
2. an upper open-end peripheral engagement rim at the bottom of said tubular portion, said upper engagement rim being of enlarged diameter relative to the diameter of said tubular portion and comprising
   a. a radially extending flange
   b. a flexible inner bight portion contiguous with said radially extending flange and the bottom of said tubular portion,
   c. an upper depending annular skirt,
   d. an outer bight portion continguous with the outer circumference of said flange and the upper edge of said skirt, and
   e. equidistantly spaced engagement fasteners at the bottom of said depending annular skirt, which comprises,
      1. a tab, and
      2. a flexible bight portion contiguous with the bottom of said annular depending skirt and the outer edge of said tab and serving as a flexible hinge for said tab,
      3. said tab projecting inwardly and in its natural unflexed position being generally aligned parallel with said radially extending flange and
      4. said tab in its fully flexed position, being aligned generally parallel with said upper depending annular skirt;

B. a lower receiving and supporting tub which comprises:

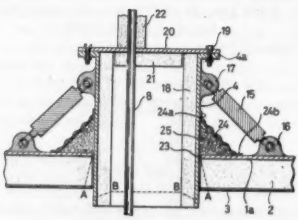
1. a bottom,
2. an upwardly extending annular wall for supporting a loaded bag, and
3. a lower open-ended peripheral engagement rim at the top of said wall, said lower engagement rim being of enlarged diameter relative to the diameter of said tub, and said lower engagement time comprising:
   a. a radially extending flange,
   b. an inner bight portion contiguous with the top of said annular wall and the inner circumference of said flange,
   c. a lower depending skirt in spaced relation to said wall,
   d. an exterior bight portion at the outer portion of said flange and contiguous with the upper portion of said lower depending skirt,
   e. the outer diameter of said lower depending skirt of said tub being less than the interior diameter of said upper depending skirt of said upper member to allow for snug fit between said upper and lower skirts,
   f. the lower depending skirt being inwardly flexible in response to the downward pressure of said upper engagement rim to allow for the upward and outward flexure of said inwardly projecting tabs of said upwardly depending skirt;
   g. the tabs of said equidistantly spaced engagement fasteners snapping downwardly and inwardly to detachably engage the bottom of the lower depending skirt upon lateral flexure of said skirt and thereby holding the upper vertical supporting member in detachable engagement with said lower receiving tub.

3,927,787

HATCH CONSTRUCTION IN A LOW TEMPERATURE LIQUID TANK

Kihei Katsuta; Tsutomu Matsumoto, both of Nagasaki, and Chiaki Matsuyama, Tokyo, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed June 7, 1974, Ser. No. 477,420
Claims priority, application Japan, June 22, 1973, 48-70553
Int. Cl.² B65D 25/18
U.S. Cl. 220—9 LG **5 Claims**



1. A hatch construction for a low temperature liquid tank having a tank wall with heat insulation on its interior and a hatch opening through said tank wall, comprising a tubular hatch dome extending through the opening and having an

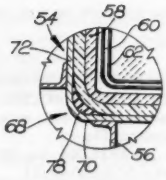
outer upper end, supporting means for supporting the hatch dome on said tank connected between said tank wall and said dome at a location on said dome spaced above said tank wall, and heat insulation seal means connected between said tank wall and said hatch dome at a spaced location above said wall and below the connection of said support to said hatch dome and extending around the periphery of said hatch dome and sealing and insulating between said hatch dome and said plate.

3,927,788

CRYOGENIC LIQUID CONTAINMENT SYSTEM

Theodore C. Zinniger, Livermore, and Phillip J. Burke, San Jose, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 12, 1974, Ser. No. 487,959
Int. Cl.² B65D *87/24*; B63B *25/08*
U.S. Cl. 220—9 LG **25 Claims**



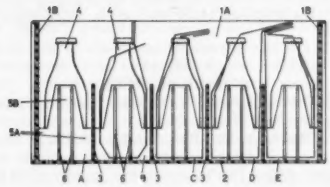
1. In a cryogenic liquid container system the combination of a containment structure provided with at least two converging walls defining a corner section of the containment structure, at least one layer or a cryogenic foam-type insulating material covering the said walls and bridging the area of intersection of said walls, the portion of the insulating material layer which bridges the area of intersection of the walls being of selectively less thickness than adjacent portions of the insulating material layer covering said converging walls so as to produce a substantially uniform stressing of the various portions of the said insulating material layer when the said insulating material layer is subjected at various times to dynamic and static loads and filler means disposed intermediate the thinner portion of the insulating material layer and said converging walls and in supporting relationship to said insulating material layer.

3,927,789

BOTTLE PACKING

Ulrich Heinrich Prodel, Grunstrasse 13, D 4902 Bad Salzuflen, Germany

Filed Nov. 4, 1974, Ser. No. 520,918
Claims priority, application Germany, Nov. 21, 1973, 2357979
Int. Cl.² B65D *1/24*
U.S. Cl. 220—21 **12 Claims**



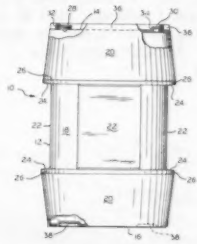
1. A bottle packing comprising a plastic case having side walls and a bottom, a plurality of parallel primary partitions dividing the interior of said case into a plurality of sections each of which is of a width to receive a bottle and a plurality of parallel secondary partitions perpendicular to said primary partitions dividing each of said sections into a plurality of individual bottle compartments, a central portion of each of said secondary partitions being higher than opposite end portions adjacent said primary partitions or said side walls, and bottle carriers adapted to be received in said sections of said case and each holding a plurality of bottles, each of said carriers having side walls and a bottom, said bottom and lower portions of said side walls of the carrier being slotted to receive said secondary partitions when a carrier containing bottles is placed in said case, whereby said secondary partitions extend between and separate adjacent bottles in a carrier and also extend between and separate adjacent bottles when placed in said case without a carrier.

3,927,790

MOLDED CONTAINER

Edward J. Chase, and William R. Topper, both of Newark, Del., assignors to Container Corporation of America, Chicago, Ill.

Filed Jan. 20, 1975, Ser. No. 542,241
Int. Cl.² B65D *7/42*
U.S. Cl. 220—72 **1 Claim**



1. A unitary molded container comprising:
a. a tubular body having a continuous wall closed at its top and bottom ends by respective top and bottom closure members integrally formed with said wall;
b. said wall having a central portion and a pair of frustoconically shaped end portions diverging axially outwardly from said closure members toward said central portion;
c. a pair of apertures in said top closure member to facilitate filling and emptying said container;
d. said wall having at least a pair of substantially flat indentations in said central portion forming shoulders with each of said end portions to facilitate lifting said container;
e. said indentations of a pair being disposed in the planes separated by 180° from each other and paralleling the major axis of said container.

3,927,791

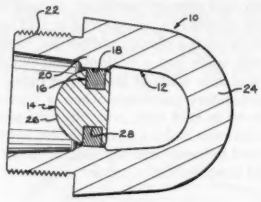
FUSIBLE PLUG

Welcome D. Hershberger, 16135 Petro Drivel, Miswaka, Ind. 46544

Filed Aug. 5, 1974, Ser. No. 494,482
Int. Cl.² B65D *25/00*; F22B *37/46*
U.S. Cl. 220—89 B **4 Claims**

1. A fusible plug assembly that is thermally responsive to ambient temperature so that a portion thereof will melt to provide a vent opening when a preselected temperature is reached, said assembly comprising a plug including a portion having a cylindrical bore defining a through passageway of uniform diameter throughout its length, an insert positioned in said bore and having around its periphery a radially outwardly directed groove facing the inner wall of said bore, and fusible material in said groove and extending into said bore in sealing relationship therewith, said material adapted to fuse at said

preselected temperature to permit said insert to pass through said bore, said insert being contoured so that its outermost surfaces conform to the shape of a sphere that has a radius



smaller than the radius of said bore so that when said material fuses the insert can pass freely out of either end of said passageway.

3,927,792

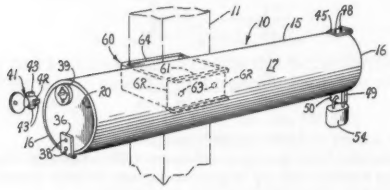
CONTAINER HAVING CONTROLLED ACCESS TO THE INTERIOR THEREOF

Eugen J. Andrade, 7511 W. Doverwood Ave., Fresno, Calif. 93705, and Eugene J. Andrade, 1511 W. Doverwood Ave.

Filed Aug. 29, 1974, Ser. No. 501,815

Int. Cl.² B65D *55/14*

U.S. Cl. 220—210 **7 Claims**



1. A container having controlled access to the interior thereof comprising a housing enclosing an article receiving compartment with a pair of entrance openings communicating therewith, a first closure mounted on the housing for movement to and from a position in sealing relation to one of said entrance openings, a lock operable by a preselected stimuli mounted on the first closure for controlled locking engagement with the housing, a second closure secured on the housing for movement to and from a position in sealing relation to the other entrance opening, and a lock operable by a preselected stimuli mounted on the second closure for controlled locking engagement with the housing.

3,927,793

TAMPER PROOF SEAL FOR A CONTAINER

Hanno Langen, Gottmadingen, Germany, assignor to Swiss Aluminum Ltd., Chippis, Switzerland

Filed Apr. 10, 1974, Ser. No. 459,475

Claims priority, application Germany, Apr. 13, 1973, 2318668

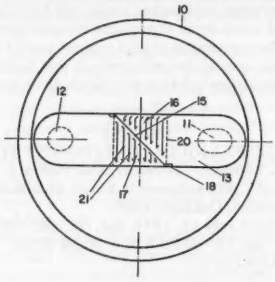
Int. Cl.² B65D *41/32*, *41/00*

U.S. Cl. 220—266 **6 Claims**

1. A lid for a container holding fluid contents, including a body having an opening for pouring and an opening for admitting air, and a strip of foil connected to said body and disposed for sealing said openings on the side of said body facing out from said container,

the improvement comprising,

said strip of foil consisting of sections divided by a line of weakness to exhibit a feature of originality to show that



said container has not been opened in any way at said openings.

3,927,794

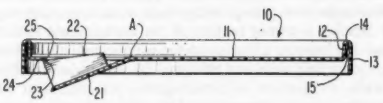
CONTAINER AND CAP WITH DEPRESSIBLE SECTION FOR DRINKING ACCESS

Frank H. Erdman, Holmes Beach, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.

Filed Sept. 20, 1974, Ser. No. 507,974

Int. Cl.² B65D *41/32*

U.S. Cl. 220—268 **22 Claims**



1. A container comprising:

a. a bottom wall portion, and a sidewall portion extending from said bottom wall portion and terminating at an open upper end defining an upper container edge; and

b. a cap covering said open upper end, said cap including:

a cover section comprising:

i. a central portion,

ii. an edge portion extending downwardly from the periphery of said central portion for embracing the sidewall portion of the container adjacent the upper container edge,

iii. a depressible tab on said central portion defined by a generally U-shaped groove of diminished cross section and operable to form an opening of adequate dimensions to provide access to the contents of said container when the tab is depressed,

iv. a raised block integral with said depressible tab adjacent said U-shaped groove, and

v. frictional block engagement means disposed on the underside of said cover section for engaging said block and retaining said block and tab in a depressed position.

3,927,795

MOLDED ARTICLE

William H. Robinson, New Vienna, Ohio, assignor to Buckeye Molding Co., New Vienna, Ohio

Filed Mar. 12, 1973, Ser. No. 339,997

Int. Cl.² B65D *41/32*

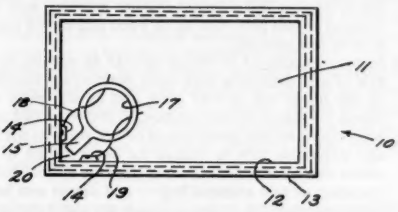
U.S. Cl. 220—269 **4 Claims**

1. In a closure having a skirt portion for sealing engagement with a container, the combination comprising

a wall portion joined to other portions of the closure and defining weakened sections in said wall portion and forming marginal edges of a severable and re-closable spout-

like tab including a crisp portion and additionally including a retention tab adjacent said crisp and joined to other portions of the closure,

rupture-producing means including a member joined to said wall portion and having a distal end spaced apart from said wall portion and readily graspable by a user, and



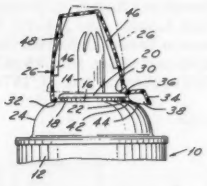
stress concentration means adjacent each of said weakened sections and augmenting and transferring force from said rupture-producing means to cause rupture of said wall portion along said weakened sections and thereby form and open said tab when a force is applied to said member.

3,927,796

CONTAINER AND CLOSURE THEREFOR

Harvey B. Whitehouse, 26050 Avondale, Inkster, Mich. 48141

Filed Apr. 16, 1975, Ser. No. 568,662
Int. Cl.² B65D *43/04*
U.S. Cl. 220—281 **4 Claims**



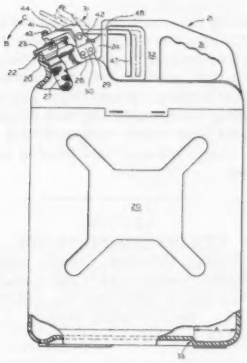
1. A container and closure therefore, said container comprising a body having opening means at the top thereof, said top of the container including an upper surface and an upper member spaced thereabove defining a slot therebetween, said container having a downwardly and outwardly directed surface portion extending from said upper surface, a closure received on the top of the container to cover said opening means, said closure having a lower edge portion, first and second diametrically opposed lips extending radially inwardly from said lower edge portion, a tab, a flexible hinge member connecting said tab to the lower edge portion of the closure at substantially the location of said first lip, said tab having a first cam portion on the underside thereof, a second cam portion contiguous with said first cam portion, said first cam portion contacting said downwardly and outwardly directed surface portion of the container adjacent said slot upon downward movement of the tab (assuming the container to be in a generally vertical position), said first cam portion having a configuration applying a generally upward force against the hinge member and lower edge portion of the closure to which the hinge is attached upon downward movement of the tab thereby resulting in upward movement of said lower edge portion of the closure and release of said first lip from the slot, said first cam portion being of a length whereby movement of the tab downwardly to a position where the first cam portion has entirely cammed over said surface of the container adjacent said slot results in said first lip being positioned above said upper member, said first cam portion, when in said latter position, being spaced from said upper member a distance at least equal to the width of said second lip, said second cam portion contacting the surface of the container adjacent said slot upon further downward movement of said tab, said second cam portion having a configuration applying a generally horizontal force against the hinge and lower edge portion of the closure to which the hinge is attached upon such further downward movement of said tab thereby resulting in horizontal movement of the closure and release of said second lip from the slot and freeing the closure from the container.

3,927,797

PLASTIC JERRY CAN

Frank S. Flider, Chicago, Ill., assignor to Justrite Manufacturing Company, Chicago, Ill.

Filed Jan. 21, 1974, Ser. No. 434,939
Int. Cl.² B65D *45/00*
U.S. Cl. 220—318 **3 Claims**



1. An all plastic blow-molded can,

said can having an integral fin located at the top thereof,

a two position handle upwardly disposed from said fin and integral thereto,

said can having a single neck opening at one side of the top thereof for dispensing fluid from said can,

means comprising a substantially horizontal bar having an end thereof disposed downward to the top of said can at the side of the can opposite to said necked opening,

a vertical post extending upward from the top of said can to meet said horizontal bar,

said vertical post means being substantially centrally located on the top of said can and being spaced apart from the portion of said horizontal bar extending downward to the top of said can whereby the person can grasp the horizontal bar between the downward extending portion and said vertical post,

fluid flow control hardware means attached to said fin on the top of the can,

said control hardware means including a saddle bracket attached to said fin by fasteners passing through said bracket and the fin without piercing the walls of the can, said hardware comprising a cap for closing said necked opening on the end of a bracket pivotally attached to said saddle bracket,

hook lever means attached to said pivotal bracket,

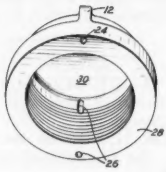
the hook on said lever being positioned adjacent to said vertical post to enable the manipulation of said cap, while holding said vertical post, and

bottom grip means held by the user when said can is in a horizontal position, whereby the user of the can can hold the post with one hand while manipulating said control hardware means and using the other hand on the bottom grip means to hold the can in a horizontal position, while dispensing fluid therefrom.

3,927,798
VENTED CAP

Lyon K. Loomis, P.O. Box 618, Coconut Grove Station, Miami, Fla. 33133

Filed Jan. 23, 1975, Ser. No. 543,627
Int. Cl.² B65D 51/16
U.S. Cl. 220—374 7 Claims

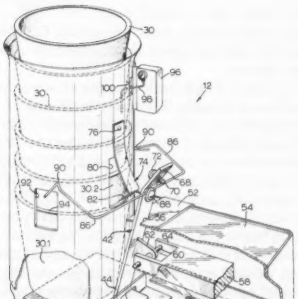


1. A vented cap for a tank containing volatile liquids, such as a fuel and the like, comprising a dome-like housing having a hollow inner portion and adapted to be securely engaged on pipe means of a tank, shoulder means disposed at the bottom periphery of said housing, vertical finger grip means integral with said housing, hole means disposed through said finger grip means, said hole means communicating between said hollow upper inner portion of said housing and an exterior part of said cap.

3,927,799
CUP DISPENSING DEVICE

Ronald John Tindley, Uxbridge, Canada, assignor to Gilron Holdings Limited, Scarborough, Calif. Canada

Filed Dec. 2, 1974, Ser. No. 528,704
Int. Cl.² B65G 59/06
U.S. Cl. 221—223 10 Claims

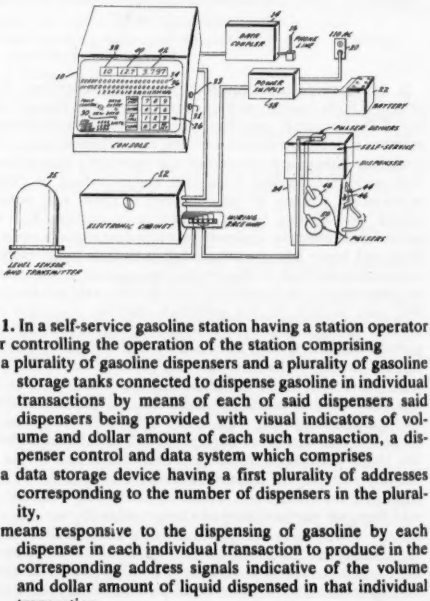


1. A dispensing device for dispensing articles such as beverage cups and the like, comprising:
- a sliding tongue adapted to move from a first position to a second position;
- a dispensing tube open at both ends and adapted to accommodate a plurality of stacked articles; said sliding tongue being arranged to underlie at least a portion of the bottom end of said dispensing tube when said tongue is in its first position, and to be substantially clear from the bottom end of said dispensing tube when said tongue is in its second position; the direction of sliding motion of said tongue being substantially perpendicular to the axis of said dispensing tube;
- a pivot arm attached at its lower end to said sliding tongue, and arranged to extend through a slot formed in a pivot bracket so as to pivot about an edge of said slot;
- a solenoid having a solenoid arm connected to said pivot arm and adapted to pivot said pivot arm from a first position to a second position upon actuation of said solenoid, and to retain said pivot arm in said second position for as long as said solenoid remains actuated; said first position of said pivot arm being when said sliding tongue is in its first position;
- a detent arm adapted to extend through an opening in the side of said dispensing tube upon interference therewith by the upper end of said pivot arm as said pivot arm moves towards its second position, so that when said pivot arm is in its second position said detent arm extends into said dispensing tube to engage the outer surface of the article therein which was second from the bottom before actuation of said solenoid began; said detent arm being biased outwardly so as not to engage the outer surface of any cup in said dispensing tube except when interfered with by said pivot arm;
- said pivot arm being arranged to move said sliding tongue from its first position to its second position when said arm is pivoted from its respective first position to its second position upon actuation of said solenoid and movement of said solenoid arm;
- and means for causing the return of said sliding tongue from its second position to its first position when actuation of said solenoid is completed, and also to cause return of said pivot arm from its second position to its first position.

3,927,800
CONTROL AND DATA SYSTEM

Herbert G. Zinsmeyer; Rodney L. Johnson, both of Austin; Ralph H. Genz, Leander, and James E. Setliff, Austin, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 398,987, Sept. 20, 1973, abandoned. This application Jan. 17, 1974, Ser. No. 434,196
Int. Cl.² B67D 5/06
U.S. Cl. 222—26 42 Claims



1. In a self-service gasoline station having a station operator for controlling the operation of the station comprising
- a plurality of gasoline dispensers and a plurality of gasoline storage tanks connected to dispense gasoline in individual transactions by means of each of said dispensers said dispensers being provided with visual indicators of volume and dollar amount of each such transaction, a dispenser control and data system which comprises
- a data storage device having a first plurality of addresses corresponding to the number of dispensers in the plurality,
- means responsive to the dispensing of gasoline by each dispenser in each individual transaction to produce in the corresponding address signals indicative of the volume and dollar amount of liquid dispensed in that individual transaction,

means responsive to signals indicating the level or volume of gasoline remaining in each storage tank to receive signals indicative of such remaining volume of gasoline, means for displaying and transferring data indicative of such level or volume to an individual address in said data storage device different from the addresses in the first plurality,

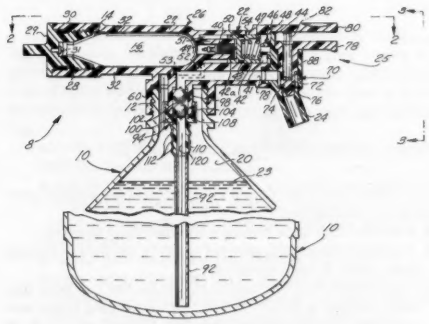
display means displaced from the gasoline dispensers and constructed to provide a visual display of the volume and dollar amount of liquid dispensed in an individual dispenser in an individual transaction, and

means operable by the station operator for interrogating individual data storage addresses in the first plurality to obtain a generation by the display means of displays representative of the volume and dollar amount of liquid dispensed in the individual dispenser in the individual transaction.

3,927,801
DISPENSER FOR CARBONATED BEVERAGE OR THE LIKE

Richard E. Martin, Willoughby, and Anthony M. Gildone, Euclid, both of Ohio, assignors to GMF Inc., Cleveland, Ohio

Filed June 28, 1974, Ser. No. 484,122
Int. Cl.² B67D 5/14; F15D 1/02
U.S. Cl. 222—61 **4 Claims**

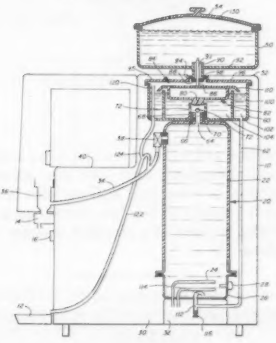


1. In a carbonated beverage dispenser having means for defining a flow path for the carbonated beverage from a container thereof to an outlet opening, a valve means for selectively opening and closing the outlet and a foam inhibiting means in the flow path upstream from said valve means for defining a passage portion of varying cross-section over a finite distance within the path for retarding foaming of the carbonated beverage over said flow path, said flow inhibiting means including means for reducing the flow area along the path from a first relatively large area to a second relatively small area, for increasing the flow area along the path from the second relatively small area to a third relatively large area, for reducing the flow area along the path from the third relatively large area to a fourth relatively small area, and for increasing the flow area along the path from the fourth relatively small area to a fifth relatively large area, the improvement wherein the finite distance of said flow path is defined by a member having a chamber, said foam inhibiting means comprising first and second ball members of equal diameter located in said chamber, chamber inlet means defining a seat for said first ball member and defining with said first ball member a passage therebetween for flow of fluid into said first relatively large area of said chamber, chamber outlet means defining a seat for said second ball member and defining with said second ball member a passage therebetween for flow of fluid from said fifth relatively large area of said chamber toward said valve, the difference between the diameter of said balls and the diameter of said chamber being 0.012 inches so that said balls are free to shift laterally in said chamber while fluid flows therethrough, and the difference between the sum of the diameters of both balls and the distance between said seats being 0.01 inches so that said balls are free to shift vertically in said chamber while fluid flows therethrough.

3,927,802
MANUAL FILL HOT BEVERAGE DISPENSER

Ronald B. Lavochkin, Burlington, and John Gardner, Tewksbury, both of Mass., assignors to Jet Spray Cooler, Inc., Waltham, Mass.

Filed Mar. 5, 1974, Ser. No. 448,352
Int. Cl.² B67D 5/62
U.S. Cl. 222—67 **14 Claims**



1. A hot liquid food dispenser comprising

a housing and a discharge spout on the housing,

a hot water tank within the housing including a heating element for heating water in said tank,

a duct connected to the tank adjacent the top and to the spout for carrying water from the top of the tank to the discharge spout and a valve for controlling flow of water through the duct,

a water reservoir on the housing which may be manually filled and located above the tank,

means connected between the reservoir and the bottom of the tank for directing water from the reservoir to the bottom of the tank,

said means including an auxiliary chamber and a transfer duct connecting the reservoir to the chamber,

a passage connecting the chamber to the tank whereby water in the tank may flow into the chamber when the tank is full,

and a second valve in said means for controlling flow from the reservoir to the tank and including a float disposed in said chamber causing the second valve to close when the water in the chamber reaches a selected level.

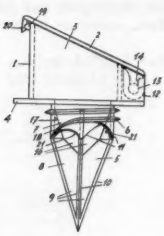
3,927,803
PIERCING SPOUT

Alwin Weber, Uetlibergstrasse 178, 8003 Zurich, Switzerland

Continuation of Ser. No. 329,215, Feb. 2, 1973, abandoned. This application Aug. 16, 1974, Ser. No. 498,074
Claims priority, application Switzerland, Feb. 10, 1972, 1948/72
Int. Cl.² B67B 7/26
U.S. Cl. 222—91 **7 Claims**

1. In a piercing spout, for use in connection with thin walled containers, said spout including a cup that is open on top, a flange connected at its upper side to the bottom of said cup for defining a discharge opening, a piercing member including an axially elongated collar having one end thereof connected to the underside of the flange, a tapered, pointed member secured to the other end of the collar and an external threading on said collar extending from a first thread near said pointed member towards said flange including a plurality of intersect-

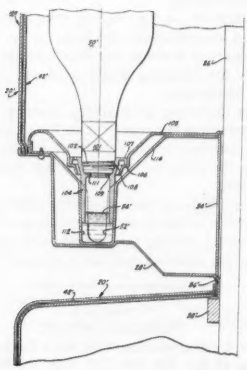
ing blades having cutting edges, the blades converging from the collar towards a common piercing point, said blades having end edges which, in combination with said collar, define apertures, said apertures communicating interiorly with said discharge opening, a plurality of free rims formed on the end of the collar opposite the flange, each said free rim comprising



an inner wall surface and a corresponding outer wall surface, the improvement comprising, each free rim defining a recessed edge portion between said wall surfaces in the areas between adjacent blades and the first thread, each recessed edge portion being inclined in a direction counter to the incline of the thread.

3,927,804
LIQUID DISPENSER WITH MULTI-CONTAINER RESERVES

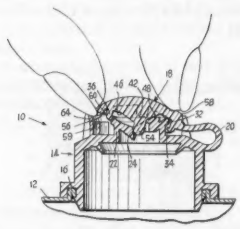
Heiko T. DeMan, 435 Cola Ballena, Alameda, Calif. 94501
Continuation-in-part of Ser. No. 355,665, April 30, 1973, abandoned. This application Mar. 7, 1974, Ser. No. 449,038
Int. Cl.² B67D 5/52
U.S. Cl. 222—136 **5 Claims**



1. A liquid dispensing apparatus for a variety of kinds of liquids from a multi-container source of each kind, comprising means for supporting a plurality of containers arranged by the distinctive character of their contents so that containers of the same content are disposed in a group, pump means, means permitting fluid interconnection between at least one group of said containers and said pump means, dispensing faucet means including means for selectively activating said pump means, tube means fluidly interconnecting said dispensing faucet means and said pump means, said container support means for each group including a liquid receptacle for each container in the group such liquid container being maintained with respect to said support means in an open-mouthed, inverted, position, permitting gravity flow of liquid from each container into a receptacle, said receptacles in each group being fluidly interconnected so as to permit a common liquid level in the receptacles for the group, said container support means including means serving to support individual containers in the group so that their outlets are disposed above the common liquid level in their respective receptacles and including tubular means extending from the container outlet to below the common liquid level, the containers being arranged on said support means so that the bodies of liquid in the respective containers are at different elevations permitting the containers in the group to empty sequentially affording long continuous supply to said pump means.

3,927,805
TILT/LIFT SAFETY CLOSURE

Morton B. Stull, 221-223 Banta Ave., Garfield, N.J. 07026
Filed Oct. 15, 1973, Ser. No. 406,671
Int. Cl.² B67D 5/32
U.S. Cl. 222—153 **23 Claims**



1. A safety cap construction for hand-held dispensers, comprising in combination:

a. a tubular cap body having a top discharge opening,

b. a captive closure cap adapted to fit the opening of the cap body so as to seal the same,

c. cooperable yieldable detent means on the cap body and cap, tending to hold the latter firmly on said body, said yieldable detent means extending through an angle of substantially greater than 180° about the cap body,

d. a flexible hinge web structure connecting said cap body and closure cap for holding the latter captive while enabling it to be swung from a sealing position closing off the opening of the body to a discharge position removed from the opening of the body, said web structure comprising an elongate loop extending through a semi-circle when the cap is disposed on the cap body,

e. said cap body having an upstanding flange extending at least partially around the juncture of the cap body and cap when the latter is assembled thereto in the closed, sealing position, thereby bearing access to the juncture and normally preventing the cap from being directly pryed off by the fingers, said cap body having an upstanding spout portion disposed within the confines of the upstanding flange,

f. said cap having a normally inaccessible lifting edge on its underside,

g. cooperable pivot bearing means on the upstanding spout portion of the cap body and cap and including a fulcrum disposed substantially diametrically across the underside of the cap, for raising one portion of the lifting edge higher than other portions thereof and above adjacent portions of the flange in response to depressing movement of an off-center portion of the cap, said edge moving upward to a position exposing it to enable engagement thereof by the fingers of the user for prying the cap off of the cap body, and

h. means for stiffening the closure cap against flexing during such depressing movement to prevent deformation

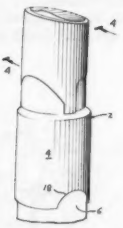
thereof and thus insure adequate raising of the lifting edge.

3,927,806

APPLICATOR FOR ATTACHMENT TO A SPRAY MIST DISPENSER

Philip Meshberg, 85 Old Oaks Road, Fairfield, Conn. 06604

Continuation-in-part of Ser. No. 286,916, Sept. 7, 1972, abandoned. This application Dec. 20, 1973, Ser. No. 426,478
Int. Cl.[2] B65D *83/14*
U.S. Cl. 222—402.12 4 Claims



1. An applicator for attachment to a container for dispensing spray mist, the container being of the type having a dispensing valve provided with a projecting stem which releases a jet of spray upon limited axial motion of the stem in a direction relatively inward of the container, the applicator comprising,

a housing adapted to at least partially enclose the container, said housing further including,

a tubular sidewall adapted to surround the stem of the dispensing valve, said sidewall having an axial outer end spaced remotely from the container and an axial inner end,

a radial port extending through said sidewall,

means mounted within said sidewall adapted to grip the stem of the dispensing valve and to direct the jet of spray released thereby through said radial port,

two aligned, axially extending, closed slots through said sidewall at opposite extremities of a diameter thereof which is disposed perpendicularly to the axis of sid radial port, each having an enlarged opening at its inner axial end,

a sleeve telescopically mounted on said sidewall for axial sliding motion between a retracted position overlying said radial port, and an extended position in which at least a major portion of said sleeve is positioned beyond the outer end of said sidewall, with cooperable abutting portions of said sleeve and said sidewall at a position directly above said radial port when said sleeve is in an extended position thereby insuring that pivoting of the sleeve is only possible in a direction which will align it with said radial port, and the end of said sleeve, when said sleeve is in said retracted position, terminating such that it does not extend above the top of said tubular side wall thereby preventing dust or dirt collection on the inside of said sleeve,

two ears extending from an axially inner end of said sleeve in partially overlapping relation to said slots,

two bosses projecting from said ears slidingly received in said slots, said bosses abutting against the closed outer ends of said slots in the extended position of said sleeve and enabling pivoting motion thereof into generally concentric alignment with said radial port, each said boss having,

an enlarged head, of a size permitting said enlarged head to freely pass through the enlarged opening in said slots, positioned internally of said sidewall, said head overlapping the adjacent edges of said slot to prevent motion of said boss out of said slot except when in a fully retracted position, and

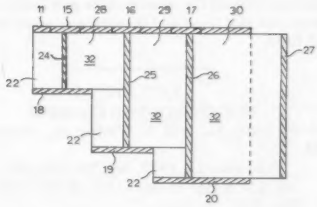
a raised surface at the lower end of said sidewall below said radial port, said surface acting as a stop to prevent said sleeve from sliding in said slots when pivoted to a dispensing position.

3,927,807

DISPENSER FOR FLOWABLE PARTICULATE MATERIAL

Michael L. Austin, 1132 Cedar St., Berkeley, Calif. 94702

Filed Nov. 18, 1974, Ser. No. 524,574
Int. Cl.[2] G01F *11/28*
U.S. Cl. 222—430 3 Claims



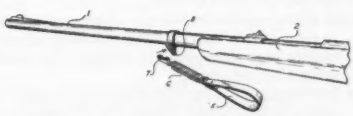
1. A dispenser for permanent attachment to a container of flowing particulate material comprising an outer element fixed with respect to the container and an inner element which is slidable with respect to the outer element between open and closed positions; and where, in closed position, the inner element and outer element cooperate to form a plurality of closed compartments of predetermined volume, said outer element including for each of said plurality of closed compartments an upper wall, a lower wall and two side walls but no front or back walls, with the distance between the upper wall and the lower wall for each compartment being different and with one of the upper wall and the lower wall of each closed compartment having a closable opening to dispense particulate material, said inner element including for each of said plurality of closed compartments a front wall, a back wall and side walls, but no upper wall and no lower wall, an operating means disposed to extend outside of said container and, when operated, to slide said inner element with respect to said outer element between open and closed positions, and means for attaching said dispenser to a container for particulate material.

3,927,808

DEVICE FOR FIREARM

Aron Albin Steen, Vitsand, Sweden, assignor to Elektro-Mekanik, Vitsand, Sweden

Filed June 4, 1974, Ser. No. 476,261
Int. Cl.[2] F41C *29/00*
U.S. Cl. 224—1 A 6 Claims

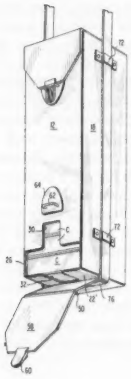


1. A gun steadying device in combination with a shoulder-held gun for steadying the same during aiming and firing, said device comprising in combination:

an elongate sling made of non-elastic pliable material, said sling being adapted to be slipped about the wrist for the hand on the arm of the gunner supporting the gun barrel when holding a gun in position for aiming and firing;

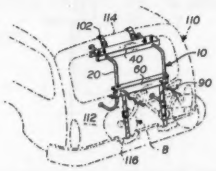
an elongate stretchable elastic member biased to contract to minimum length secured to one end of said sling;
a fastening means secured to the other end of said stretchable member; and
mounting means on the gun for releasably and pivotally attaching said fastening means to the gun, said mounting means being disposed for placing the assembly including said sling, said stretchable member and said fastening means in a position in a vertical plane including the gun barrel;
the location of said mounting means on the gun, said fastening means, the length of said sling and the length of said stretchable member in its relaxed state being such that placement of the respective hand of the gunner in the holding and aiming position requires stretching of said stretchable member, said stretching applying a force to said hand toward the muzzle of the gun thereby steadying the grip of said hand and thus the gun while being aimed and fired.

3,927,809
FILM CARTRIDGE CARRIER
Richard W. Klein, Sr., 101 S. Whiting St., Alexandria, Va. 22304
Filed Jan. 22, 1975, Ser. No. 542,988
Int. Cl.² A45C *11/00, 11/38;* **B65D** *83/00*
U.S. Cl. 224—5 R **1 Claim**



1. A case for holding a plurality of generally flat, thin cartridges having a rectangular periphery and a depth comprising,
an elongated case having an open top and having a rectangular cross-section that is slightly larger and congruent to said periphery such that said case can receive a stack of said cartridges through said open top,
said case defined by a front panel, a back panel, a pair of side panels and a bottom,
said front panel terminating a distance from said bottom slightly greater than said depth to form an opening sufficiently large to remove the bottommost cartridge of said stack of cartridges,
a first finger notch formed in said front panel and a finger notch formed in said bottom and said notches forming a part of said opening,
a pivotal cover at said top for selectively opening and closing said open top,
a bottom cover having,
a first section having a pivot line along said bottom, said pivot line extending perpendicular to each of said side walls and approximately midway between said front and said rear panels,
a second section pivotally connected to said first section and foldable upwardly so as to close said opening,
interengaging means on the outer end of said second section and said front panel for securing said bottom cover thereto, and
a carrying strap circumscribing said case and traversing said bottom along said pivot line whereby said strap will give support to said pivot.

3,927,810
BICYCLE SUPPORT RACK
Michael Danon, New York, N.Y., assignor to Leisure Moments Incorporated, New York, N.Y.
Filed Mar. 26, 1973, Ser. No. 344,734
Int. Cl.² B60R *9/10*
U.S. Cl. 224—29 R **3 Claims**



1. An article support rack for attachment to selected body portions of a vehicle; said rack comprising:
a. a pair of laterally spaced U-shaped side members;
b. each of said side members including a pair of leg portions of unequal length adapted to abut selected spaced body portions of the vehicle, and an intermediate portion interconnecting said leg portion;
c. a pair of brace members extending transversely of the side members; each of said brace members being of channel shape cross section having flange portions and an intermediate web portion;
d. the flange portions of said brace members having aligned open end slots at the opposite end portions thereof for receiving the side members and permitting the brace members to be slidably moved to selected positions on the side members;
e. one of the brace members being mounted on the intermediate portions of the laterally spaced side members and the other one of said brace members being mounted on one set of the laterally spaced leg portions of said side members;
f. means for securing the brace members to the selected positions on the side members;
g. article carrier means projecting outwardly from one of the brace members; and
h. additional means for securing the support rack to selected body portions of the vehicle;
i. whereby said side members are supported in spaced apart relation solely by said brace members, and whereby said brace members may be adjustably moved to selected positions on said side members to permit collapsing of the support rack for storage.

3,927,811
COLLAPSIBLE CARRIER FOR BICYCLES
Henry Nussbaum, Los Angeles, Calif., assignor to Henry Nussbaum
Filed May 6, 1974, Ser. No. 467,613
Int. Cl.² B60R *9/10*
U.S. Cl. 224—42.03 B **2 Claims**

1. In a carrier for mounting on an automobile or the like, the combination comprising:
a. first u-shaped member having a base portion and leg members attached thereto and extending therefrom, a

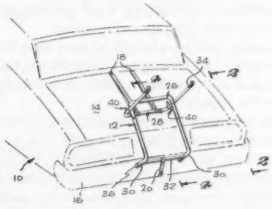
substantially perpendicular leg interconnected with each extending leg member at the end of the leg opposite its connection to the base;

b. a second u-shaped member having a base portion and elongated leg members, acting as carrying members;

c. first cross means connecting said perpendicular legs near the interconnections of the extending legs to the perpendicular legs;

d. pivot means, rotatingly coupling the extending leg members and the elongated leg members of said first and second u-shaped members;

e. latching bracing means connecting the extending leg members and the elongated leg members of said u-shaped members, for rigidly configuring said u-shaped members at substantially right angles to each other with said perpendicular legs adapted to bear against a surface of said



vehicle with said carrying members extending oppositely outward and for permitting said u-shaped members to rotate relative to each other to assume a substantially parallel configuration for compact storage;

f. said latching bracing means including an elongated bracing member having an elongated substantially J-shaped slot therein, and operable with a cooperating post slidable therein for locking said U-shaped members in the carrying configuration;

g. biasing means coupled to said latching bracing means for urging said bracing member slot into a locking engagement with the cooperating post; and

h. first and second attaching members connected to said first cross means and said second U-shaped member base portion, respectively, said attaching members being adapted to fasten to an automobile or the like.

3,927,812

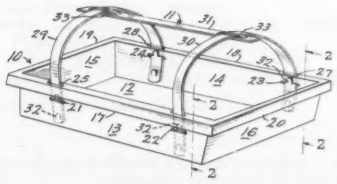
CARRYING HANDLE

Russell M. Winters, and Frederick Sell, both of 1257 S. Crissey Road, Holland, Ohio 43528

Filed Jan. 25, 1974, Ser. No. 436,734

Int. Cl.[3] B65D *5/46*

U.S. Cl. 224—48 R **3 Claims**



3. A greenhouse flat for holding and protecting plants and flowers comprising a bottom, upwardly diverging side and end walls and an outwardly extending lip on at least said sidewalls, said lip and sidewalls having adjacent aligned slots, and a detachable lifting and carrying handle comprising a longitudinally extending central strap adapted to be carried by hand and a pair of parallel spaced crossmember straps extending transversely to said central strap and having ends received by such aligned pairs of said lip slots and said sidewall slots, and means on said straps adjacent said ends for retaining said cross-member straps in said slots, said central strap extending between and being attached to said cross-member straps.

3,927,813

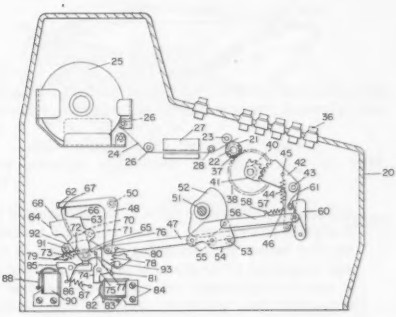
RECORD FEED CONTROL MECHANISM

Yasuhiro Inagaki, Hiratsuka, Japan, assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 5, 1974, Ser. No. 495,030

Int. Cl.[2] B65H *17/26*

U.S. Cl. 226—135 **12 Claims**



1. In a record material feeding mechanism for feeding a record material a plurality of predetermined lengths, the combination including:

a. a record material feeding means;

b. a sensing member mounted for movement in a sensing direction;

c. means for moving said sensing member in said sensing direction;

d. means interconnecting said sensing member and said feeding means to move said feeding means a length commensurate with the length of movement of the sensing member in a sensing direction;

e. a plurality of first blocking means mounted in the path of movement of said sensing member each selectively movable to a plurality of blocking positions for limiting the movement of said sensing means a different length when in each blocking position;

f. second blocking means mounted adjacent said first blocking means to position said first blocking means in one of said blocking positions upon movement of said first blocking means;

g. and selectively operated actuating means operatively associated with said first blocking means for positioning the first blocking means in one of said blocking positions when not actuated, said actuating means moving said first blocking means into engagement with said second blocking means upon operation of said actuating means whereby said sensing member will move a predetermined length in accordance with the blocking position of said first blocking means.

3,927,814

GUIDE FOR A MOVING BELT

William J. Holm, Springfield, Vt., assignor to Riggs & Lombard, Inc., Lowell, Mass.

Continuation of Ser. No. 304,247, Nov. 6, 1972, abandoned. This application Feb. 14, 1974, Ser. No. 442,561

Int. Cl.[3] B65H *23/32*

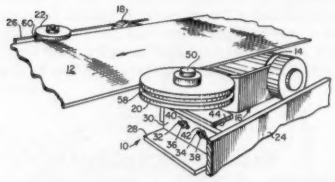
U.S. Cl. 226—199 **1 Claim**

1. Apparatus for guiding a flat belt along a predetermined path, comprising

a. rigid bracket means mounted in fixed position adjacent opposite sides of said path,

b. a pair of peripherally grooved rollers rotatably mounted in fixed position to said bracket means one on each side of said path in position to engage opposing edges of said belt,

c. the grooves of said roller being co-planar with said belt whereby the edges of said belt pass through said grooves, the opposing annular side walls of each of said grooves being parallel to one another over a substantial portion of the depth of said groove and spaced from one another by



a distance substantially equal to the thickness of said belt,

d. a guide roll rotatably mounted in fixed position to said bracket means and extending transversely of said path and tangential to the plane of said belt and said grooves,

e. said bracket means including a fixed base portion and adjustable arm portions, said roll and rollers being mounted to said arm portions in fixed geometrical relation, said arm portions normally being rigid and fixed in operation to prevent displacement of said rollers by said belt, and,

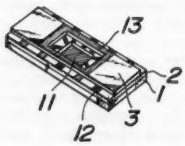
f. a bearing mounted to each of said arm portions for engaging and supporting the ends of said roll.

3,927,815

METHOD FOR PRODUCING MULTILAYER METALLIZED BERYLLIA CERAMICS

Shunzo Mase, and Tetsuo Watanabe, both of Nagoya, Japan, assignors to NGK Insulators Ltd., Nagoya, Japan

Division of Ser. No. 307,147, Nov. 16, 1972, Pat. No. 3,889,041. This application Mar. 24, 1975, Ser. No. 561,477
Claims priority, application Japan, Nov. 22, 1971, 46-92997
Int. Cl.² B23K *31/02*
U.S. Cl. 228—121 **20 Claims**



1. A method for producing multilayer metallized beryllia ceramics which comprises applying on a plurality of beryllia green sheets a metallizing paste consisting of 60–97% by weight of at least one metal selected from the group consisting of molybdenum and tungsten, 1.5–39.6% by weight of beryllia and 0.03–20% by weight of at least one rare earth metal oxide selected from the group consisting of lanthanum oxide, yttria and praseodymium oxide and a thermally volatile binder, provided that the amount of the rare earth metal oxide being not more than the amount of beryllia, laminating these sheets and firing the laminated sheets under a non-oxidizing atmosphere.

3,927,816

HOT DIPPED STEEL TUBE AND A METHOD FOR PRODUCING THE SAME

Matsuichi Nakamura, Osaka, Japan, assignor to Daiwa Steel Tube Industries Co., Ltd., Osaka, Japan

Filed Feb. 15, 1974, Ser. No. 442,860
Int. Cl.² B23K *31/06*
U.S. Cl. 228—147 **3 Claims**

1. A method of producing a hot galvinized steel tube in a continuous in-line process comprising:

continuously pulling a length of steel strip from a supply and moving the strip along its length through a predetermined path and maintaining tension in the strip as it is pulled from the supply;

continuously shot blasting at least one surface of the strip as the strip is moved along its path at a position along the path where the strip is in tension;

continuously cold-forming the strip into tubing after the strip has been shot blasted with the surface of the strip which has been shot blasted forming the outside surface of the tubing;

continuously hot welding the tubing closed along its length as the tubing continues to move along its length;

continuously cooling the welded tubing and controlling the heat distribution from the weld seam about the circumference of the tubing to maintain the welded seam warmer than the remaining portions of the tubing;

continuously acid pickling the exterior surface of the tubing to remove the oxide film from the surface of the tubing;

continuously applying a hot metal coating to the exterior surface of the tubing;

continuously quenching the tubing; and

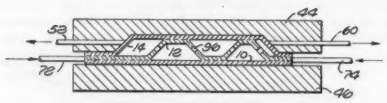
continually cutting the tubing into lengths of tubing.

3,927,817

METHOD FOR MAKING METALLIC SANDWICH STRUCTURES

C. Howard Hamilton, San Pedro, and Leonard A. Ascani, Jr., Palos Verdes Estates, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 511,900, Oct. 3, 1974. This application Mar. 20, 1975, Ser. No. 560,437
Int. Cl.² B23K *31/02*
U.S. Cl. 228—157 **38 Claims**



25. A method of making a metallic sandwich structure from a plurality of workpieces comprising:

providing a plurality of metal blank workpieces, each of said workpieces having two opposed principal surfaces, at least one of said workpieces having an effective strain rate sensitivity;

positioning said workpieces in a stack contacting at their principal surfaces, at least one of the outer workpieces of said stack having an effective strain rate sensitivity;

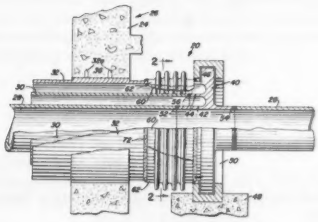
joining preselected areas of said stack of workpieces;

providing at least two shaping members;
enclosing at least one chamber by positioning said stack of workpieces relative to said shaping members;
heating said at least one outer workpiece to a temperature suitable for superplastic forming, and
inducing tensile stress in said at least one outer workpiece causing at least a portion of said at least one outer workpiece to expand superplastically into said at least one chamber and to form against, and into intimate contact with, at least one of said shaping members.

3,927,818
METHOD OF INSTALLING CYLINDRICAL BELLOWS

Edward F. Harrington, Jr., Louisville, Ky., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 315,047, Dec. 14, 1972, abandoned. This application Aug. 21, 1974, Ser. No. 499,342
Int. Cl.² B23K *31/02*
U.S. Cl. 228—189 **3 Claims**

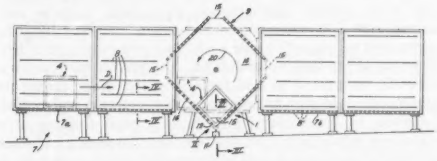


1. A method of installing around a pipeline a cylindrical bellows having spaced inner and outer plies in radial registry with each other along a series of circumferential convolutions comprising the steps of sectioning each ply into longitudinal sections, positioning the sections of said inner ply around said pipeline, welding the sections of said inner ply together, applying a welding back-up tape to the radially inner side of an outer ply section along each longitudinal edge, positioning the sections of said outer ply around said inner ply such that said outer ply sections are spaced from and are in radial registry along the series of circumferential convolutions with said inner ply, and welding the sections of said outer ply outward of said tape together.

3,927,819
METHOD OF TREATING THE CORNERS OF PLANAR POLYGONAL WORKPIECES

Joseph Lang, Wurttemberg, Upper Palatinate; Helmut Meckenstock, Waltrop, and Hans-Joachim Nopper, Oberkoplitz, all of Germany, assignors to Flachglas Aktiengesellschaft Delog-Detag, Gelsenkirchen, Germany

Division of Ser. No. 402,577, Oct. 1, 1973. This application July 15, 1974, Ser. No. 488,772
Int. Cl.² B23K *37/04*
U.S. Cl. 228—212 **1 Claim**

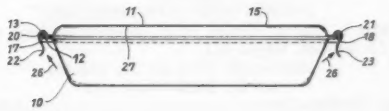


1. A method for treating a corner of a planar workpiece of polygonal outline comprising the steps of:
standing said workpiece on its edge in an upright position;
displacing the standing workpiece horizontally along a conveyor to a treatment location;
tilting the standing workpiece and a portion of the conveyor at the treatment location about a horizontal axis to position a corner thereof adjacent a treatment tool;
treating said corner with said tool by soldering the workpiece corner with said tool;
further tilting the workpiece after treatment thereof to stand same on the conveyor downstream of said tool on an edge different from the edge the workpiece stood on before treatment; and
displacing the workpiece in an upright condition along said portion of the conveyor back past said tool after treatment thereof.

3,927,820
CONTAINER

Ulrich Wagner, Esslinger, and Eugen Scherr, Ebersbach, both of Germany, assignors to Wilhelm Wagner, Esslingen, Germany

Filed Aug. 7, 1972, Ser. No. 278,359
Claims priority, application Germany, Aug. 6, 1971, 2139587
Int. Cl.² B65D *1/00*
U.S. Cl. 229—3.5 MF **13 Claims**

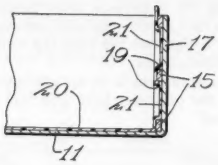


1. In a two-part thin-walled metal container for storing and serving prepared food, said container being of the type that has (a) a receptacle and (b) a lid removably secured to said receptacle for covering the same, the improvement comprising,
A. an external reinforcing flange having a smooth horizontally extending portion and a rolled portion at its outer edge, with two opposed sections of the flange forming retaining zones;
B. two opposed edge zones forming part of said lid, said edge zones corresponding in their extent to respective ones of the retaining zones, each said edge zone having a first portion which fits flat against the horizontally extending portion of its respective corresponding retaining zone and a second portion which extends outwardly from the first portion and is bent from above downwardly and inwardly about the rolled portion of its respective corresponding retaining zone, each said bent zone constituting a retaining clip
C. an integral grip tab adjoining at least one of said retaining clips for disengaging the latter from the corresponding retaining zone of said flange;
D. two further opposed sections of the flange; and
E. two further opposed edge zones of said lid, said further edge zones corresponding in their extent to respective ones of the further opposed sections of the flange, each said further edge zone having a first portion which fits flat against the horizontally extending portion of its respective corresponding flange section and a second portion which extends outwardly from the first portion and is bent to form a guide way for the outer edge of its respective corresponding flange section, wherein:
i. said lid is free of score lines; and
ii. said lid can be removed from the receptacle without severing and utlizing said guide ways.

3,927,821
LINED CARTON

Robert M. Dunning, St. Paul, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Sept. 27, 1974, Ser. No. 509,847
Int. Cl.² B65D 5/56
U.S. Cl. 229—14 BL 6 Claims

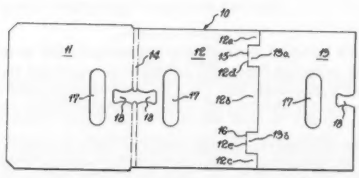


1. A paperboard carton corner in combination with a carton having a base panel, a pair of walls hinged to the base panel, and a corner flap hinged to one wall and overlapping the other wall to form an area of double thickness, the inner layer of the double thickness area having an aperture therethrough, and a plastic liner film attached to the inner surface of said paperboard, said film extending through said aperture and secured to the outer layer of said double thickness area to hold the overlapping portions in overlapping relation.

3,927,822
CARTON WITH IMPROVED ENDS

Buddy E. Giebel, Monroe, Mich., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 4, 1974, Ser. No. 520,644
Int. Cl.² B65D 13/00, 5/46
U.S. Cl. 229—23 R 5 Claims



1. A one-sheet blank made from a generally rectangular sheet of paperboard having three connected panels adapted to be folded into a triple end wall for a Bliss-type carton in which the bottom and side walls are secured to two individual end walls comprising:

a transverse score line connecting the inner and outer panels of said triple end wall, the said inner panel having a width and height equal respectively to the width and height of the carton;

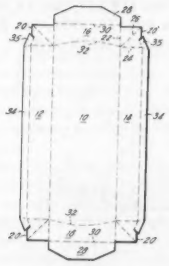
the outer and intermediate panels of said triple end wall being connected along separated hinged knife cuts each parallel to and equally spaced from the transverse score line and being disconnected along cut lines parallel to and intermediate the hinged knife cuts and cut lines extending from the parallel cut lines to the hinged knife cuts to provide thereby projections in the outer wall, located between the hinged knife cuts, the height of the outer panel from the transverse score line to the parallel cut lines of the projections being substantially equal to the height of the carton; and

the height of said intermediate panel when reversed folded 180° over the outer panel extending from the hinged knife cuts to approximately the transverse score line and being shorter than the height of the carton whereby, when the panels and hand-holes are superimposed to form an end wall for a carton, there will be a saving of board with ample areas in the projections to secure the bottom wall to the end walls and sufficient intermediate panel to the top of the carton to minimize any weakness in the upper portion of such wall.

3,927,823
BLANK OF A FOLDABLE MATERIAL SUCH AS CARDBOARD AND A TRAY ERECTED THEREFROM

Karl Rune Persson, Halmstad, Sweden, assignor to Sprinter Pack AB, Halmstad, Sweden

Filed Sept. 5, 1973, Ser. No. 394,443
Claims priority, application Sweden, Sept. 13, 1972, 11806/72
Int. Cl.² B65D 5/36
U.S. Cl. 229—31 R 7 Claims



1. A blank of foldable material for forming a folding tray comprising:

a bottom; opposite sidewalls articulated along a fold line at one side thereof to said bottom; an edge flange articulated along a fold line to another side of each sidewall and adapted to be folded to lie against an exterior surface of the associated sidewall; opposite endwalls articulated at one end thereof to said bottom along an arcuate-shaped folding line; an edge flap articulated to another end of each endwall along a substantially straight folding line; locking means extended from and articulated along a fold line at opposite ends of each sidewall; each sidewall and each endwall being adapted to be erected in a common direction relative to the bottom for assembly of the tray; each edge flap being folded over to lie against an adjacent endwall, each locking means being folded to lie between an adjacent endwall and the associated folded-over edge flap, whereby the curved shape of the erected edge flaps and endwalls retain the enclosed locking means therebetween to maintain the respective endwalls and sidewalls in the erected condition.

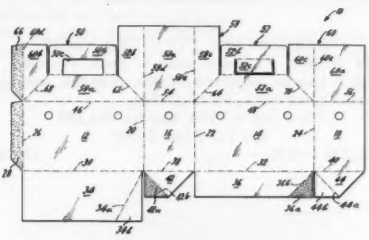
3,927,824
SELF-ERECTING BOX

Margot Razziano, Bethpage, N.Y., assignor to Blum Folding Paper Box Co., Inc., Valley Stream, N.Y.

Filed Nov. 21, 1973, Ser. No. 417,736
Int. Cl.² B65D 5/02
U.S. Cl. 229—37 R 6 Claims

1. A box adapted to be erected from a collapsed configuration to an erected configuration comprising hingedly connected side and end walls, side bottom members hingedly connected to respective side walls, said side bottom members dimensioned to overlap each other, and end bottom members hingedly connected to said respective end walls, means for connecting said side bottom members and said end bottom members to form overlapping bottom panel-forming units which are movable relative to each other between a collapsed configuration in which said bottom panel-forming units are in substantially coplanar engagement with said side walls and said end walls and an erected configuration in which said overlapping bottom panel-forming units are substantially per-

pendicular to said side walls and said end walls and form a bottom panel, having one side bottom member overlapping the other, side top members hingedly connected to said respective end walls, each of said end top members including a



central top panel-forming member and side flaps hingedly connected thereto, said central top panel-forming members adapted to be folded into coacting relation to form a top panel and said side flaps adapted to maintain said top panel in position to securely close the top of said box.

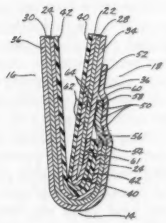
3,927,825
BAG

Robert J. Stearley, Des Moines, Iowa, assignor to Great Plains Bag Corporation, Des Moines, Iowa

Continuation-in-part of Ser. No. 227,821, Feb. 22, 1972, abandoned. This application Jan. 24, 1974, Ser. No. 436,131

Int. Cl.² B65D *33/02*

U.S. Cl. 229—55 **3 Claims**



1. A bag comprising

a tubular container having forward and rearward walls comprised of at least an inner plastic ply and first, second and outer paper plies;

each of said plies having front and rear panels with upper and lower edges;

said lower edges of said front and rear panels of said inner and first plies being coincident with one another;

said lower edge of said second ply front panel being spaced above said lower edges of said inner and first plies;

said lower edge of said outer ply front panel being spaced above said lower edge of said second ply front panel;

said lower edge of said second ply rear panel being below said lower edges of said inner and first plies when said plies are in an unfolded condition;

said lower edge of said outer ply rear panel being below said lower edge of said second ply rear panel when said plies are in an unfolded condition;

said bag being folded along a single straight fold imposed at a level below said lower edges of said second and outer ply forward panels and above said lower edges of said inner and first plies, said front first ply panel being in facing engagement with said front panel of said second ply and said rear panel of said outer ply being in facing engagement with said front panel of said outer ply, said rear panel of said second ply being in facing engagement with said front panel of said outer ply,

an adhesive material joining said folded over portions of said first ply front panel and said outer ply rear panel to said second ply front panel and said outer ply front panel respectively, said adhesive material also joining said folded over portion of said second ply rear panel to said outer ply front panel.

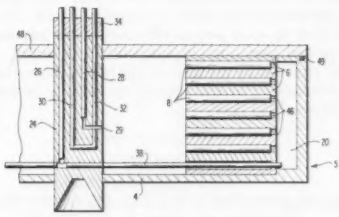
3,927,826
ROTOR FOR CENTRIFUGAL TESTING OF ELECTROPHORESIS GEL

Norman G. Anderson, and John E. Caton, Jr., both of Oak Ridge, Tenn., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Aug. 27, 1974, Ser. No. 500,866

Int. Cl.² B04B *15/02, 1/04*

U.S. Cl. 233—11 **14 Claims**



1. An apparatus for preparing identical electrophoresis gels comprising:

a rotor having a generally cylindrical body;

means for rotating said rotor;

a plurality of stacked plates, each plate having a multiplicity of radial grooves in its upper and lower surfaces each groove so sized and shaped as to form one half of a cylinder, each pair of said plates being in a juxtapositionally matchable plate-to-plate relationship so as to form a plurality of gel casting tubes therebetween, said plates having an outer radius smaller than that of said rotor so that a space is formed between said stack of plates and the inner surface of the outer wall of said rotor; and

means to feed a liquid solution to said space;

whereby as liquid is fed to said space while said rotor is rotated, said liquid solution is forced inwardly from said space into said gel casting tubes.

3,927,827
METHOD FOR CONTROLLING THE VENTILATION OF AN AIR-CONDITIONING SYSTEM

Ove Strindehag, Jonkoping, Sweden, assignor to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Apr. 5, 1974, Ser. No. 458,313

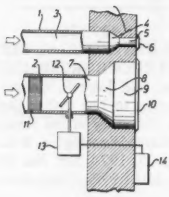
Claims priority, application Sweden, Apr. 13, 1973, 7305238

Int. Cl.² F24F *7/00*

U.S. Cl. 236—49 **7 Claims**

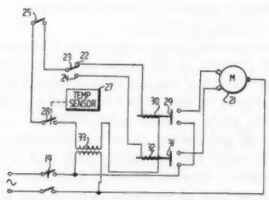
1. In an air-conditioning system in which the ventilation in a space is varied upon demand without substantially changing the temperature or humidity of the air supplied to the space by varying the volume of conditioned air, the method of ventilating the space which consists of supplying the air to the space in a plurality of partial flows and maintaining the total impulse of the supplied air relatively constant independent of the volume of air supply between a minimum volume and a maximum volume, said method comprising the steps of maintaining at least one of said partial flows supplied to the space with a constant velocity and volume flow to thereby maintain

the impulse of said one partial flow constant at a high impulse, and supplying at least one other of the partial flows at a velocity substantially below the velocity of said one partial flow to provide a low impulse, and controlling the ventilating by varying the volume of said low-velocity partial flow without substantially changing the temperature or humidity, said variation being between a minimum flow and a maximum flow,



the impulse of the maximum flow in said other partial flow being substantially less than the impulse of said one constant partial flow so as to permit variation of the impulse of said other partial flow without substantially affecting the total impulse provided by the total of said partial flows, the impulse being determined by multiplying the velocity of the flow by the volume of the flow.

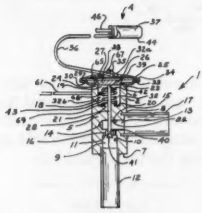
3,927,828
VENTILATION SYSTEMS
Herman W. Jones, Rte. 2, Box 84B, Albany, Ky. 42602
Filed Sept. 30, 1974, Ser. No. 510,177
Int. Cl.² F24F 7/00
U.S. Cl. 236—49 **6 Claims**



1. A ventilating system for a closed area having at least two vent openings therein comprising:
a fan within one of said vent openings;
a reversible electric motor coupled to said fan;
means mounted outside of said closed area for determining the direction of the prevailing wind;
a directional switch connected to and controlled by said means mounted outside of said closed area;
means coupling said switch to said motor for controlling the direction of the motor drive in accordance with the direction of said prevailing wind;
means for measuring the prevailing wind velocity; and
switch means coupled to said means for measuring said wind velocity, said switch means being in series with said directional switch and being deactivated at a predetermined wind velocity.

4. A ventilating system for an enclosed area having at least two vent openings comprising;
a fan within one of said vent openings;
a reversible electric motor coupled to and driving said fan;
means for determining the direction of the prevailing wind outside of said enclosure;
means connected between said last named means and said motor for controlling the direction of rotation of said motor in accordance with the direction of said prevailing wind;
means for measuring the prevailing wind velocity; and
means connected between said last named means and said motor for deactivating said motor at a predetermined wind velocity.

3,927,829
THERMOSTATIC EXPANSION VALVE
Richard Willner, St. Louis; Jude A. Pauli, Florissant, and Frank A. Latuda, Maryland Heights, all of Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed July 5, 1974, Ser. No. 486,197
Int. Cl.² G05D 27/00
U.S. Cl. 236—92 B **13 Claims**



1. A thermostatic expansion valve comprising:
a valve body having an inlet port and an outlet port interconnected by an expansion port, said valve body having a cavity formed in it, said cavity including a bottom wall having an opening in it, said opening being aligned with said expansion port in said valve body;
a diaphragm actuated valve attached to said body and closing said cavity, said valve including an enclosure having a first section and a second section, said first and said second sections being joined to one another about said cavity to define a chamber therewith, a flexible diaphragm mounted between said first and said second sections along the outer periphery of said diaphragm, said diaphragm dividing said chamber into a first chamber portion and a second chamber portion, a valve pin having first and second ends, said valve pin being mounted in said opening so that said second end extends through said expansion port, said valve pin being operatively connected to said diaphragm and movable in response to said pressure differences between said first and said second chamber portions, a stop valve mounted to the second end of said valve pin and adapted to regulate the opening of said expansion port as said valve pin moves in response to said pressure differences, a spring completely enclosed by said valve body and said diaphragm valve so as to prevent mechanical connections to said spring for adjusting the force exerted by said spring, said spring being positioned in said second chamber portion and biased so as to exert a force on said diaphragm in a direction which tends to close said expansion port, the force of said spring being predetermined and nonadjustable, and
pressure generating means responsive to temperature operatively connected to the first chamber portion of said chamber, said pressure generating means being charged to a pressure to set the operating point of said valve.

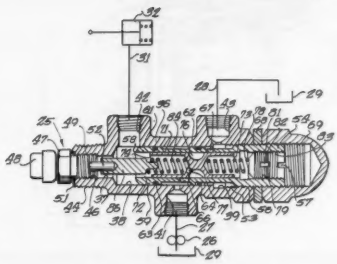
3,927,830
CONTROL VALVE
Michael Briski, Rockford, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 25, 1974, Ser. No. 508,976
Int. Cl.² G05D 23/12
U.S. Cl. 236—100 **7 Claims**

4. A control valve for regulating fluid pressure comprising:

a body member including a bore, a control port, an inlet port and a relief port, each of said ports intercepting said bore;

a tubular sleeve disposed for longitudinal adjustment within said bore having an open end arranged for communication with said control port and including a relief aperture and an inlet aperture communicating respectively with said relief port and said inlet port;

a shifting spool slidably disposed within said sleeve for movement with respect to said inlet and relief apertures,



said spool having passage means including a circumferential groove communicable with said apertures and an opening communicating said groove with an end portion of said spool communicating with said open end of said sleeve;

bias means engaging said spool; and

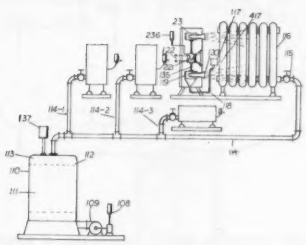
a thermal sensing device operatively associated with said spool, said spool being shiftable in response to pressure in said control port and temperature sensed by said thermal sensing device.

3,927,831

HEATING SYSTEM

Edwin M. Bailey, 194 W. Ridgewood Ave., Ridgewood, N.J. 07450, and David Y. Bailey, 381 Western Ave., Cambridge, Mass. 02139

Filed Aug. 13, 1973, Ser. No. 387,960
Int. Cl.² F24D *1/02*
U.S. Cl. 237—9 R **6 Claims**



1. A vapor heating system comprising:

a boiler normally containing water with a head space thereabove;

first means coupled to said boiler to heat the water therein in response to control means, thus producing heated vapor;

an arrangement of radiators interconnected by piping;

second conduit means communicating with the head space and connected to the arrangement for conducting the vapor thereto;

third means coupled through the arrangement to the head space for continuously or intermittently moving air from the atmosphere through all or part of said arrangement, the air entraining heated vapor as it passes through the space; and

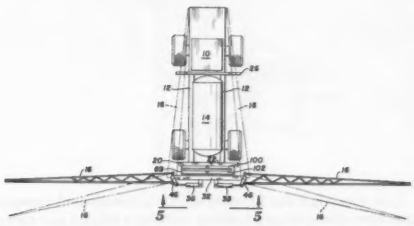
fourth thermostatically controlled valve means coupled to at least one of the radiators for releasing said moved air therefrom as long as the temperature in the vicinity of the radiator is below the temperature setting of the thermostatic control, the entrained vapor carried by the air condensing in the radiator to release heat to the vicinity via the radiator itself.

3,927,832

HORIZONTAL BOOM LIFT ARMS

William G. Robison, Alpha, and Ronald D. Bieker, Jackson, both of Minn., assignors to Ag-Chem Equipment Co., Inc., Minneapolis, Minn.

Filed July 31, 1974, Ser. No. 493,386
Int. Cl.² B05B *1/20*
U.S. Cl. 239—168 **8 Claims**



8. In an agricultural spray apparatus of the type including a vehicle having a fluid reservoir mounted thereon and a pair of booms which may be rotatably extended about a generally vertical axis from said vehicle for dispensing the fluid in said reservoir over a given area, a boom elevating mechanism comprising:

a. a first frame having first and second vertical members fixedly attached to the rear of said vehicle on opposite sides of the center line of said vehicle;

b. a second frame having a pair of extensible booms coupled thereto positioned rearward of said first frame with respect to said vehicle, said second frame comprising:

1. first and second cylindrical shafts held together in a vertical, parallel and spaced apart relationship by first and second horizontal cross members;

2. first and second cylindrical sleeve members disposed on the lower ends of each of said first and second shafts;

3. means connecting said booms individually to said first cylindrical sleeve on said first and second shafts; and

4. means for imparting a rotational motion to said second cylindrical sleeve on said first and second shafts;

c. coupling means slidably engaging said first and second vertical members on said first frame and coupled to said second frame;

d. means including a pair of lifting arms pivotally anchored at their respective inner ends to said first frame and each being coupled at their respective outer ends to one of said pair of extensible booms;

e. means for simultaneously displacing said coupling means substantially equal distances in a vertical direction;

f. third and fourth cylindrical sleeve members individually disposed on the upper ends of said first and second cylindrical shafts; and

g. linear motion producing means coupling said third and fourth sleeve members to said booms.

3,927,833

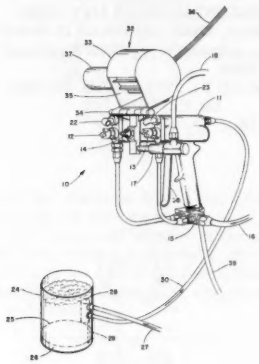
APPARATUS FOR FORMING MULTIPLE-COMPONENT COMPOSITE STRUCTURES

David Harrison, and Raul T. Sainz, both of Miami, Fla., assignors to Ransburg Corporation, Indianapolis, Ind.

Division of Ser. No. 464,994, April 29, 1974. This application July 25, 1975, Ser. No. 599,139

Int. Cl.² B05B *7/08, 7/14, 7/24*

U.S. Cl. 239—306 **6 Claims**



1. A spray gun for forming multiple-component composite structures comprising a housing forming a handle and carrying a trigger, a pair of spray-forming means carried at the forward portion of the housing at spaced-apart locations, each of said spray-forming means being adapted for connection with a source of plural component material, an atomizing nozzle carried by the housing at a location centrally located between the pair of spray-forming means and adapted for connection with a source of curing agent, a pair of granular emitting means carried by the forward portion of the housing, each of said granular emitting means being located closely adjacent one of said pair of spray-forming means, a pair of passageways formed by the housing and connected at the rear with the source of granular material, cutter means for cutting fibrous materials adjustably carried by the housing having an orifice for the ejection of cut fibers located above the granular emitting means and centrally located therebetween, a valve means within the housing operated by the trigger simultaneously causing the operation of the spray-forming means, the curing agent atomizing nozzle, and the cutter means.

3,927,834

SPRAYER

Tetsuya Tada, 1339 Nishitadadomari, Onoda, Yamaguchi, Japan

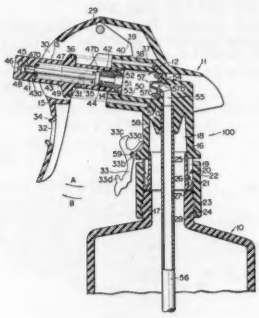
Filed Sept. 27, 1974, Ser. No. 509,909

Claims priority, application Japan, Feb. 12, 1974, 49-16942

Int. Cl.² A62C *11/04;* **B05B** *11/06, 7/02;* **B67D** *5/40*

U.S. Cl. 239—359 **5 Claims**

1. A sprayer comprising a sprayer head having a cylindrical chamber opened at one end, passage means communicating with said chamber through the bottom thereof, for introducing a spray liquid into the chamber, valve means for permitting only the flow of the liquid from said passage means to the chamber, a piston member slidably inserted into the chamber from said opened portion thereof and having at its outer end portion a nozzle for ejecting the liquid, a lever for moving said piston member toward the bottom portion of the chamber, and a locking member for locking, when the sprayer is out of use, the lever with the piston member placed in the innermost position of the chamber to cause the inner end of the piston member to close said valve means, said locking member being rockably mounted on the sprayer head and having an engagement portion for being engaged with the lever, said sprayer further comprising a container for receiving a spray liquid



therein, and wherein said sprayer head is provided with an air port for preventing generation of a negative pressure within said container, and said locking member includes a closing portion for closing, when the lever is locked, said port simultaneously with the locking of the lever.

3,927,835

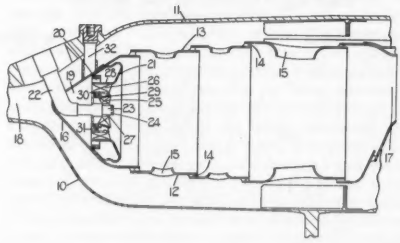
LIQUID ATOMISING DEVICES

Alan Joseph Gerrard, Blackburn, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Nov. 5, 1973, Ser. No. 412,821

Int. Cl.² B05B *1/34*

U.S. Cl. 239—400 **3 Claims**

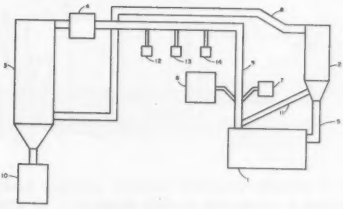


1. A liquid atomising device comprising a tubular body through which, in use, air is caused to flow, an air swirler within the downstream end of the body and formed of a plurality of blades, a passage within the body for a liquid and an elongated nozzle having a plurality of holes communicating with the said passage and arranged to inject liquid for atomisation into the airstream downstream of said swirler in a direction transverse to the air flow, each said hole being adjacent to the root of an associated blade of the swirler and being directed radially from the axis of said body, the tubular body extending substantially only over the axial length of the swirler and this being surrounded by a further swirler of different air flow characteristics, means permitting limited movement between the nozzle and the further swirler in a direction transversely with respect to the length of the nozzle and the body being formed by a ring on the outer periphery of the inner swirler and a further ring on the inner periphery of the further swirler, these rings being connected.

3,927,836
FINE FLAKED ALUMINUM MANUFACTURE

J. Rand Thurgood, West Jordan, and Robert B. Clay, Bountiful, both of Utah, assignors to Ireco Chemicals, Salt Lake City, Utah

Filed July 23, 1974, Ser. No. 491,028
Int. Cl.² B02C 17/04
U.S. Cl. 241—19 9 Claims



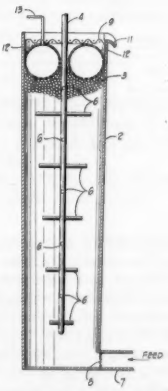
1. In a method for producing fine flaked aluminum particles comprising:
   a. milling aluminum in granulated or atomized form in a ball mill,
   b. continually supplying fresh amounts of the aluminum in granulated or atomized form to the ball mill,
   c. continually withdrawing milled fine flaked particles from the ball mill by passing an inert gas through the mill with a flow rate sufficient to carry the milled fine flaked particles from the mill, and
   d. separating the milled fine flaked particles from the inert gas;

the improvement which comprises milling the particles in a vibratory ball mill.

3,927,837
PRESSURIZED MILL AND PROCESS

Leroy P. Clark, Huron, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed July 5, 1974, Ser. No. 486,011
Int. Cl.² B02C 17/18
U.S. Cl. 241—46.11 6 Claims

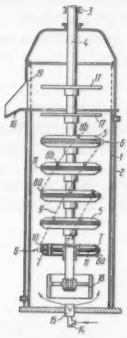


1. In a milling process wherein a body of solid particulate grinding medium is agitated in a milling zone, the improvement which comprises: pressurizing a surface of said body of particulate grinding medium by elastic inflatable means retained within said zone in contact with said surface, said pressurizing means transferring substantially uniform pressure to said surface in contact therewith.

3,927,838
WET GRINDER

Vladimir Pavlovich Soloviev, ulitsa Pervomaiskaya, 46, kv. 29, Dolgoprudny Moskovskoi oblasti; Viktor Vyacheslavovich Kafarov, ulitsa Vavilova, 48/4, kv. 247, Moscow; Alexandr Grigorievich Schus, ulitsa Mendeleeva, 20, kv. 4, Dolgoprudny Moskovskoi oblasti, and Gennady Pavlovich Stulnikov, Zhemchuzhny proezd, 3, kv. 6, Penza, all of U.S.S.R.

Filed May 20, 1971, Ser. No. 145,303
Int. Cl.² B02C 17/16
U.S. Cl. 241—46.15 3 Claims

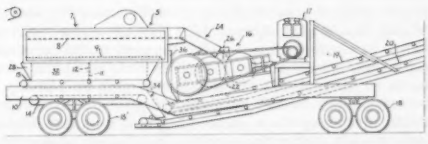


1. In a wet grinder the combination of a shell; a chamber formed within said shell and being adapted to receive a quantity of grinding bodies; a rotatable shaft extending through said chamber and a plurality of vanes secured to said shaft in axially spaced relationship, each said vane being trough-shaped and having a bottom and side walls defining interior concave surfaces, each said trough-shaped vane being disposed about said shaft with its concave surface facing the shaft; the improvement comprising: each said trough-shaped vane having a slot extending throuh the entire bottom length thereof, at least one of the side walls of said trough-shaped vane having through apertures; and external nozzles integrally formed with said trough-shaped vane, said through apertures communicating with said external nozzles, the nozzles being arranged from one vane to the next so as to aid in moving material being treated up through the grinder chamber.

3,927,839
CRUSHING APPARATUS

John N. Quinn, c/o Johnson Welding & Equipment Co., Inc., 2470 Pennsylvania Ave., Madison, Wis. 53704

Filed Aug. 5, 1974, Ser. No. 494,715
Int. Cl.² B02C 21/02; B07B 1/78
U.S. Cl. 241—76 15 Claims



13. Elongated crushing apparatus having an input station at its rear and having crusher means at a location between said input station and the front of the apparatus, characterized by: A. spaced apart elongated upper and lower conveyors extending forwardly and upwardly from a location forwardly adja-

cent to the input station, to delivery zones at different elevations at the front of the apparatus,

1. said upper conveyor being located to receive crushed materials issuing from said crusher means,
2. and the lower conveyor having its receiving end rearwardly of the upper conveyor;

B. a material receiving and classifying unit at the input station having upper and lower vibratory screens thereon for separating from the input material the two largest sizes thereof and for conducting the largest from the upper screen into the crusher means;

C. means for conducting the second largest size pieces of material from said lower screen onto the rear portion of the upper conveyor in bypass relation to said crusher means;

D. and conveyor means to receive final product size materials that pass through said screens and to conduct such final product size material onto the receiving end of the lower conveyor.

3,927,840

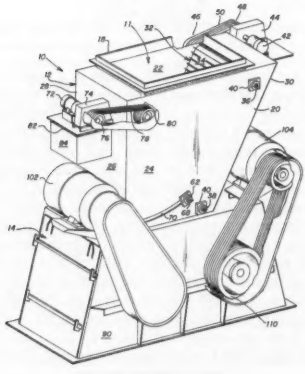
REFUSE SHREDDER

James C. Nash, Sulphur Springs, Tex., assignor to Longhorn Construction Co., Inc., Sulphur Springs, Tex.

Filed Sept. 4, 1973, Ser. No. 393,942

Int. Cl.² B02C *13/04*

U.S. Cl. 241—187 **2 Claims**



1. Apparatus for shredding materials for the subsequent processing of the shredded materials comprising in combination a pair of opposing shredding cylinders, means for rotating the cylinders, means for feeding the material to between the cylinders, means for removing shredded material from between the cylinders, and a plurality of flails attached to and radially protruding from the cylinders, each flail having no more than three links, means for pivotally connecting the links of each flail to each other and for pivotally connecting each flail to its corresponding cylinder, the pivot means permitting pivotal movements of the flails and the links about axes parallel to an axis rotation of the cylinder, each flail having an outermost link defined by a pair of spaced-apart independently pivotal segments, each segment having a first substantially straight surface facing in the direction of rotation of its associated cylinder, a second substantially straight surface which is substantially perpendicular to the first surface and which is substantially parallel to an axis of rotation of the cylinder, and an outermost cutting edge defined by the intersection of the first and second surfaces which is substantially perpendicular to the first mentioned cutting edges.

3,927,841

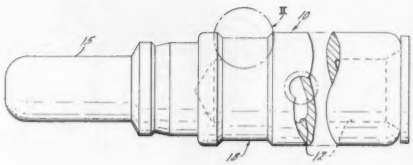
CONTACT

Cesidio R. Iacobucci, LaCrescenta, Calif., assignor to Flight Connector Corporation, Hawthorne, Calif.

Filed May 9, 1974, Ser. No. 468,467

Int. Cl.² H01R *3/02*

U.S. Cl. 339—278 C **6 Claims**



1. A metallic electrical terminal member having a body including a connection portion adapted to be attached to a conductor which is formed of a metal similar to that of the body, said body having a contact portion integral with and spaced from the connection portion, a continuous uninterrupted metallic plating covering said contact portion and extending therefrom on said body uninterruptedly toward and entirely around the body but terminating at a position spaced from the connection end of the body, and an inert plastic seal bonded to the body and to the plating and completely covering the juncture areas of the plating and body, the body being aluminum and the plating comprising an outer layer of a noble metal.

3,927,842

WIRE SUPPLY CONTROL ARRANGEMENT

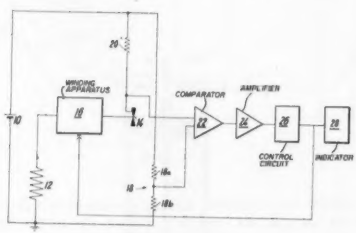
Hans Dröll, An der Rosenhelle 4, 6369 Niederdorfelden, Germany

Filed Oct. 26, 1973, Ser. No. 410,027

Claims priority, application Germany, Oct. 28, 1972, 2253053

Int. Cl.² G01R *27/14*; B65H *63/08*; H02K *15/085*

U.S. Cl. 242—1.1 R **4 Claims**

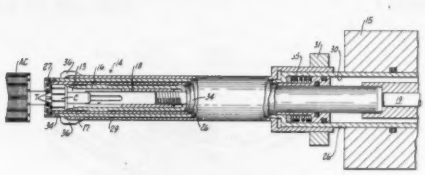


1. A wire supply control arrangement for a winding apparatus for stators of an electric machine wherein the wire from a wire supply is cut off each time after a stator is wound, said winding apparatus including a cutter device for cutting off said wire supply and said arrangement comprising an electrical circuit, connected to said cutter device and including the wire supply, for generating a first signal proportional to the resistance of the wire remaining in the wire supply, said circuit further comprising means for generating a second signal in accordance with a predetermined resistance value of the wire supply, comparator means for comparing said first and second signals and producing an output signal in accordance therewith, and utilization means connected to the output of said comparator means for utilizing said output signal.

3,927,843
ARMATURE WINDING MACHINE WITH IMPROVED LEAD RETAINING MEANS

Raymon H. Dammar, Minneapolis, Minn., assignor to Possis Corporation, Minneapolis, Minn.

Division of Ser. No. 130,649, April 2, 1971, which is a continuation-in-part of Ser. No. 721,805, April 16, 1968, abandoned. This application Oct. 1, 1973, Ser. No. 402,616
Int. Cl.² H02K *15/09*
U.S. Cl. 242—7.05 B **6 Claims**



1. In a machine for winding coils of wire onto slotted armature cores and looping the lead wires of the coils around the hook-like tangs of commutators associated with the armature cores, the combination of:

A. core gripping means to hold an armature core assembly while wire is being wound onto its core;

B. a tubular shield axially movable to and from a projected position in which an end portion thereof enshrouds and covers the hook-like tangs of the commutator associated with an armature core held by said core gripping means;

C. a tubular lead wire retaining member inside said tubular shield,

said lead wire retaining member having an inner end and an outer end and being axially movable with respect to said tubular shield to and from an operative position so positionally related to the core gripping means that while in said position its outer end portion receives the commutator of an armature core assembly held by said core gripping means;

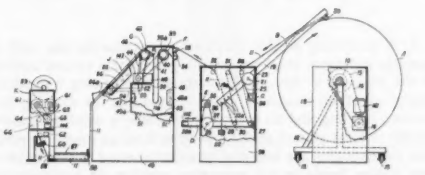
D. means on the outer end portion of said tubular lead wire retaining member to project into the hook-like tangs of a commutator received in the retaining member to engage any wire lead that has been looped around a tang and by such engagement hold the lead against displacement from the tang; and

E. drive means operatively connected with said tubular retaining member for effecting movement thereof to and from its operative position.

3,927,844
CLOTH INSPECTION DEVICE

Robert W. Bond, Greenville, and William J. Alexander, III, Mauldin, both of S.C., assignors to Bond Transmission & Controls, Inc., Greenville, S.C.

Filed Feb. 13, 1973, Ser. No. 332,072
Int. Cl. B65h *17/00, 25/22*
U.S. Cl. 242—55 **1 Claim**



1. In a cloth inspecting device, means supplying and delivering cloth to be inspected including:

A a motor driven cloth supply roll for delivering cloth therefrom;

B speed control means actuated responsive to tension in the cloth delivering from said supply roll for controlling the operation of the motor driven supply roll;

C means including a motor forming a freely suspended tensionless supply loop from cloth delivered from said supply;

D means including a motor for delivering cloth from said loop for inspection in tensionless condition;

E a power operated batcher including a motor for taking up cloth under controlled conditions of tension;

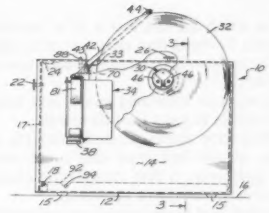
F a common means controlling the operation of the motor of said means for delivering cloth from said loop for inspection and the motor of said batcher; and

G means for reversing the direction of the batcher and said means for delivering cloth from said loop independently of said motor driven cloth supply, whereby disadvantages of reverse winding of the cloth supply are avoided.

3,927,845
TAPE HANDLING MEANS

Ralph E. Simpson, 2445 N. Highland Road, Upland, Calif. 91786

Filed Feb. 19, 1974, Ser. No. 443,390
Int. Cl.² B65H *17/02;* **F16G** *11/00*
U.S. Cl. 242—68.3 **5 Claims**



1. Hub means for supporting a wound roll of elongated materia on a support structure, comprising:

a hub body adapted for mounting at one end on said support structure to telescopically receive said wound roll, said hub body having an outer end face; and

two retainer levers pivotally mounted on said end face of the hub body to rotate on axes that are substantially parallel to the axis of the hub body,

one arm of each retainer lever being a latch arm and the other arm being an operating arm,

the two retainer levers being pivotally movable between effective positions extending beyond the outer circumference of the hub body to retain the wound roll on the hub body and retracted release positions inside the outer circumference of the hub body,

the two retainer levers lying on opposite sides of a diametrical line on said outer end face of the hub body with the two latch arms of the levers extending toward one end of the diametrical line and the two operating arms extending toward the other end of the diametrical line,

the latch arms of the retainer levers confronting each other across the diametrical line at the release positions of the levers and diverging from the diametrical line at the effective positions of the levers,

the operating arms confronting each other across the diametrical line at the effective positions of the levers and diverging from the diametrical line at the release positions of the levers,

the operating arms of the levers being equipped with respective fingerpieces that may be squeezed together between the thumb and forefinger of the operator to swing the

levers from their release positions to their effective positions.

3,927,846

SAFETY BELT UNWINDING DEVICE WITH ENERGY DISSIPATOR

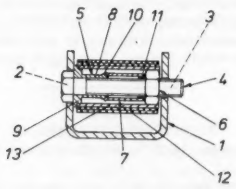
Wolfgang Meissner, Wengern, Ruhr, Germany, assignor to Gebr. Happich GmbH, Germany

Filed July 22, 1974, Ser. No. 490,885

Claims priority, application Germany, Sept. 6, 1973, 2344878

Int. Cl.² B65H 75/48

U.S. Cl. 242—107.4 **30 Claims**



1. Unwinding device with energy dissipator for a wound belt, comprising:

a belt;

a spool on which the belt that is to be unwound is wound; said spool having a first axis; means for supporting said spool for rotation about said first axis, thereby to unwind said belt;

a spindle separate from said spool; said spindle having a second axis; a support for said spindle;

energy dissipation means for dissipating the energy of unwinding of said belt from said spool; said dissipation means comprising a first abutment, a second abutment, and an energy dissipator element;

said first abutment being carried on said spindle and being engaged therewith in a manner such that rotation of said first abutment around said spindle also moves said first abutment along said spindle and along said second axis; said first abutment being connected with said spool such that said first abutment is rotated around said spindle upon rotation of said spool and that rotation of said spool to unwind said belt rotates said first abutment in a first direction;

said second abutment being near said spindle, being spaced from said first abutment and being supported axially non-shiftably with respect to said spindle such that rotation of said first abutment in said first direction moves said first abutment toward said second abutment;

said energy dissipator element extending across the space between said first and said second abutments and engaging both said abutments;

at least one part of said energy dissipation means being comprised of a relatively hard, yet deformable material such that movement together of said abutments causes deformation of the said deformable part and this absorbs the kinetic energy of unwinding of said spool without deforming said spool.

3,927,847

FILM THREADING DEVICE

Robert J. Roman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 9, 1974, Ser. No. 496,240

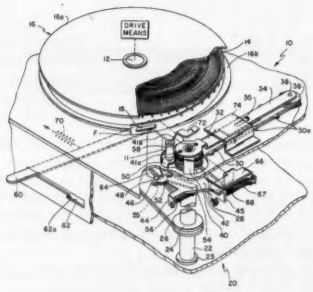
Int. Cl.² G03B 1/04; G11B 15/32

U.S. Cl. 242—192 **8 Claims**

1. For apparatus having a spindle adapted to support a roll of film having a leading end portion having an opening defined therein, said spindle being adapted to rotatably drive the roll in a take-up direction such that the leading end is separated from the roll, the improvement comprising:

a. an endless drive belt including at least one projection suitable for engaging said leading end of film through said opening as the roll is being rotatably driven by the spindle in the take-up direction;

b. means for supporting said endless drive belt to be driven in a threading direction opposed to said take-up direction, said support means being pivotally supported by the



projector for movement between (1) a first position wherein said belt is spaced from said leading end and (2) a second position wherein said projection on said belt is spaced from said roll and is engageable with said leading end through said opening; and

c. means for driving said endless belt in said threading direction and for rotatably driving the spindle in the take-up direction when said means for supporting said endless drive belt is in said second position for initiating threading of the leading end of the film from the roll.

3,927,848

RECORDING AND/OR PLAYBACK APPARATUS

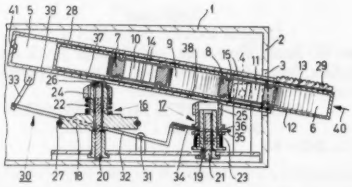
Istvan Hochbaum, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 1, 1973, Ser. No. 384,686

Claims priority, application Germany, Aug. 30, 1972, 7232077

Int. Cl.² G03B 1/04; G11B 15/32, 23/04

U.S. Cl. 242—198 **4 Claims**



1. A recording and/or playback apparatus for use with a cassette having at least one winding hub for a record carrier in the form of a tape, said apparatus comprising a cassette holder pivotably mounted in said apparatus for rotation between a loading and an operating position; a winding spindle having at least an end axially movable from an engaging position for engaging the hub of a cassette inserted in said holder, said holder being in the operating position, to a withdrawn position for being withdrawn from engagement with a cassette being inserted or removed from said holder, said holder being in the loading position; and means operable in direct response

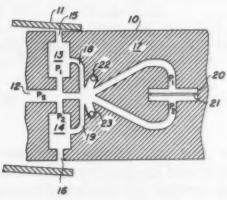
to movement of said holder for moving said spindle end between said positions.

3,927,849

FLUIDIC ANALOG RING POSITION DEVICE

Gerald E. Kovalenko, and Charles E. Woods, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 17, 1969, Ser. No. 882,409
Int. Cl.² F41G 7/00
U.S. Cl. 244—3.22 **3 Claims**



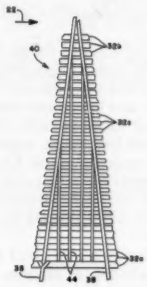
1. A position sensor for sensing the position of a body encircling member with respect to a body comprising;
a longitudinal body in the form of a cylindrical projectile;
said body having a central passageway therethrough;
at least one pair of exit ports in communication with and at right angles to said central passageway and spaced longitudinally from one end of said body;
a body encircling member comprising a ring longitudinally restrained on said longitudinal body in proximity to said exit ports;
indicator means connected to said exit ports for indicating an unbalance of fluid pressure between said ports;
said position sensor being arranged and operated such that fluid will flow through said central passageway under pressure and a portion thereof be metered through said exit ports;
said ring being adapted and arranged so that the proximity to said exit ports may vary under outside influence thereby varying the amount of fluid metered through said ports.

3,927,850

LIFTING PARACHUTE

Raymond E. Rychnovsky, Livermore, Calif., assignor to The United States of America as represented by The United States Energy Research and Development Administration, Washington, D.C.

Filed Dec. 31, 1974, Ser. No. 537,810
Int. Cl.³ B64D 17/12
U.S. Cl. 244—145 **9 Claims**



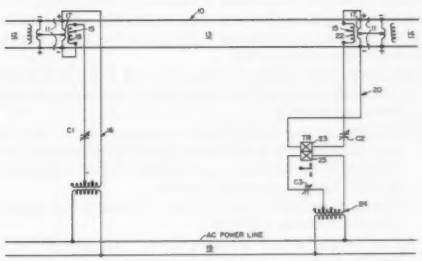
1. A lifting parachute for high speed release from an aircraft at from about mach 0.45 to about mach 1.2 comprising a canopy having a plurality of concentric circumferentially arranged ribbons generally spaced a uniform distance from one another adjacent the apex of said canopy and disposed in generally edge to edge relationship adjacent the canopy skirt, said canopy being divided into a plurality of gores by radial lines, said plurality of gores including rearward gores, side gores, and forward gores, said rearward gores of said canopy having a central portion intermediate the apex and skirt of said canopy of greater porosity compared to the porosity of the forward gores and the side gores with ribbons spaced further apart than the ribbons of said forward gores and the side gores when said canopy is inflated.

3,927,851

ALTERNATING CURRENT TRACK CIRCUIT APPARATUS

Clinton S. Wilcox, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 13, 1975, Ser. No. 540,358
Int. Cl.³ B61L 21/06
U.S. Cl. 246—37 **4 Claims**

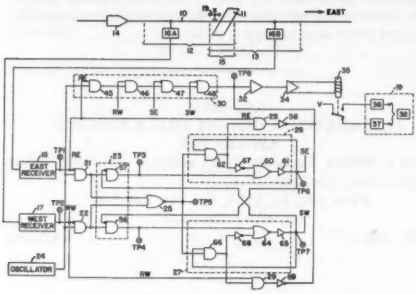


1. Alternating current track circuit apparatus for a stretch of railway track divided by insulated joints into adjoining double rail track circuits and having impedance bonds at respective transmitting and receiving ends permitting power propulsion direct current to bypass the joints, wherein the improvement comprises:
a. an alternating current track feed for connection across the track rails at the transmitting end of each of the track circuits through a circuit tuned to resonance by a capacitor connected in series with a winding of the impedance bond at that end for energization of the associated track circuit from a source of alternating current, and
b. an alternating current receiver for connection across the track rails at the receiving end of each of the track circuits through a circuit tuned to resonance by a capacitor in series with a winding of another of the impedance bonds and a track winding of a receiving relay for sensing the presence of a vehicle in the associated track section,
c. the receiver comprising a local source of energy derived from said source and connected to a local winding of the relay in series with a variable capacitor for adjustment of the phase difference between energization of the track and local windings for providing optimum sensitivity of the relay,
d. whereby improved shunting sensitivity and broken joint protection is obtained over a wide range of lengths of alternating current track circuits.

3,927,852
FAIL-SAFE LOGIC CIRCUITRY FOR VEHICLE TRANSPORTATION CONTROL

Henry C. Sibley, Adams Basin, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 282,211, Aug. 21, 1972, abandoned.
This application Apr. 1, 1974, Ser. No. 456,709
Int. Cl.² B61L 1/02
U.S. Cl. 246—126 8 Claims



1. A highway crossing control system for actuation of a warning indicator to provide a closure of the highway by a vehicle moving along a track crossing the highway, including a first track section across the highway and extending in a first direction from the highway,

a second track section overlapping said first track section across the highway and extending in a second direction from the highway,

a first and second track circuit corresponding to said first and second track section and sensing the occupancy and vacancy by a vehicle along the track in said corresponding first and second track sections,

a first and second control circuit to actuate the highway crossing warning indicator;

a first memory circuit included in said first control circuit, said first memory circuit being set by a vehicle proceeding from said first track section to said second track section and remaining set during the time such vehicle is detected in said first and second track sections,

a second memory circuit included in said second control circuit, said memory circuit being set by a vehicle proceeding from said second track section to said first track section and remaining set during the time such vehicle is detected in said first and second track sections;

said first control circuit responsive to said first and second memory circuits and providing means for actuating the highway crossing warning indicator when and only when a vehicle travelling in a direction from said first track secction to said second track section is sensed by said first track circuit in said first track section, and

said second control circuit responsive to said first and second memory circuits and providing means for actuating the highway crossing warning indicator when and only when a vehicle travelling in a direction from said second track section to said first track section is sensed by said second track circuit in said second track section.

3,927,853
HOUSEHOLD APPLIANCE LEVELING SYSTEM

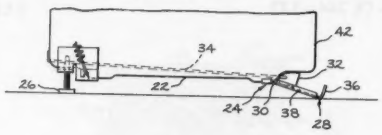
Lauren W. Guth, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Aug. 2, 1974, Ser. No. 494,223
Int. Cl.² F16M 11/40
U.S. Cl. 248—188.2 7 Claims

1. An appliance having an adjustable leveling arrangement located beneath the bottom wall of said appliance comprising:

a leveling bracket of channel-shaped configuration for supporting said appliance, said leveling bracket being mounted at one end to the bottom wall of said appliance at a point foward of the rear wall of the appliance, the opposite end being a free end abuttable with the surface upon which the appliance rests, said leveling bracket having a notch adjacent said mounted end and intermediate said mounted end and said free end;

wedge means insertable in a forwardly direction between said bottom wall of said appliance and said leveling bracket from a position at the free end of said bracket



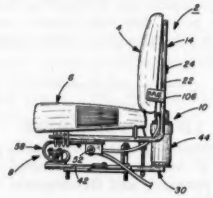
adjacent the rear wall of the appliance toward the mounted end of said leveling bracket to cause said leveling bracket to bend at said notch and to provide a downward thrust to the leveling bracket; and

a non-rotatable tension member attached to said wedge means extending along the bottom portion of the appliance and terminable at the front portion, said tension member being secured to the front portion of said appliance after adjustment of the rear of the appliance to the desired level has been accomplished.

3,927,854
AUTOMOTIVE SEAT SUSPENSION SYSTEM

Milburn K. Carey, 51 Old Plank Lane, Chagrin Falls, Ohio 44022

Filed Feb. 27, 1974, Ser. No. 446,273
Int. Cl.³ A45D 19/04
U.S. Cl. 248—372 11 Claims



1. An automotive seat including,

a resilient suspension system for pivotally supporting a seat, said system comprising,

a base frame assembly adapted for mounting on an automotive floor,

a seat frame assembly adapted for mounting a seat,

at least one loop-like spring means fixedly attached at one end to said seat frame assembly and operably connected at its other end to said base frame assembly for resiliently mounting said seat frame assembly in spaced apart relation relative to said base frame assembly,

fluid power means mounted on said base frame assembly adjacent the end opposite said spring means and operably connected to said seat frame assembly for generally vertically adjusting the latter relative to said base frame assembly,

said spring means comprises a pair of leaf spring members disposed in laterally spaced relation, each of

said spring members including upper and lower leg portions extending from a bight portion,

said upper leg portion fixedly attached to said seat frame assembly,

said lower leg portions connected to said base frame assembly,

said base frame assembly includes a pair of spaced rail members, a support bracket extending transversely between said rail members for connecting the same together at the end opposite said fluid power means, and

said lower leg portions fixedly attached to said support bracket.

3,927,855
FLUID-COOLED MOLD

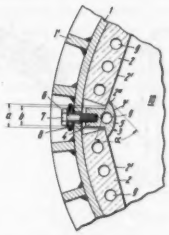
Otmar Kleinhagauer, Kapfenberg, Austria, assignor to Gebr. Bohler & Co. AG, Vienna, Austria

Filed Oct. 10, 1974, Ser. No. 513,538

Claims priority, application Germany, Oct. 25, 1973, 2353449

Int. Cl.² B22D *27/04, 35/06*

U.S. Cl. 249—79 **5 Claims**



1. In a fluid-cooled mold for receiving electroslag remelted molten metal and defining a casting space,

a plurality of plates covering at least a part of the interior of the mold and having edge portions extending longitudinally relative to the mold which define gaps between adjacent plates; and

a plurality of substantially T-shaped members disposed intermediate each pair of the plates and each having a leg and a flange, the leg of each member extending into the gap between the associated plates, the flange of each member covering the edge portions of the associated plates which confront said casting space, the width of each leg being smaller than the minimum width of the gap between the associated plates.

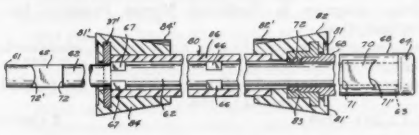
3,927,856
INTERNAL SPREADER MEANS FOR USE WITH A REUSABLE TIE ROD

Peter R. Lovisa, Pelham, and Dusan Tausanovitch, Northport, both of N.Y., assignors to Lovisa, Peter R., Pelham; Dusan Tausanovitch, Northport and Tullio Lovisa, Huntington Station, all of, N.Y., part interest to each

Division of Ser. No. 232,450, March 7, 1972, Pat. No. 3,822,860. This application Apr. 30, 1974, Ser. No. 465,530

Int. Cl.² E04G *17/06*

U.S. Cl. 249—177 **10 Claims**



1. An internal spreader means adapted to be positioned on a retractable and reusable tie rod and adapted to be positioned between concrete forms to maintain the forms a predetermined distance apart, said spreader means including an elongatable elastomeric sleeve for providing a passage for the tie rod so that after the concrete has been poured the tie rod may be retracted and removed from the internal spreader while the forms are still in place, a frustro conical cone at each end of the sleeve, each cone having an outer larger base and an inner smaller end, each cone having releasable coupling means at its base for engaging the tie rod in one position and for disengaging the tie rod in a second position from each other while the forms are still in place whereby the spreader means is removable from the concrete without damage to the internal spreader means or the concrete, each cone having embedded therein at its base an annular metal ring defining the releasable coupling means, the annular metal ring being formed having diametrically opposed slots and depending from the base of each slot are stop means capable of engaging the means defining surfaces formed on the rod.

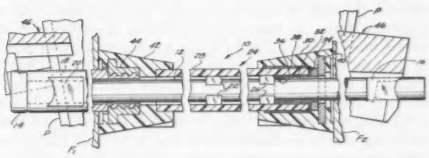
3,927,857
REUSABLE TIE ASSEMBLY FOR CONCRETE FORMS

Peter R. Lovisa, 1040 Pelhamdale Ave., Pelham, N.Y. 10803; Dusan Tausanovitch, 24 Crestwood Drive, Northport, N.Y. 11768, and Tullio E. Lovisa, 91 Whitson Road, Huntington Station, N.Y. 11746

Filed July 8, 1974, Ser. No. 486,365

Int. Cl.² E04G *17/08*

U.S. Cl. 249—217 **10 Claims**



1. A retractable reusable tie assembly for concrete forms capable of being disassembled after use comprising:

internal spreader means adapted to be coupled with concrete forms to maintain the forms a predetermined distance apart and providing a passage therethrough, the spreader means including an elongatable, elastomeric sleeve cooperating in defining the passage, a first cone securely fastened to one end of the sleeve and also having a bore defining an extension of the passage, a second loose cone removably coupled to the other end of the sleeve and having a bore defining an extension of the passage, the first cone being mechanically interlocked with the associated end of the sleeve, the mechanical interlock including a metallic insert having an internal threaded portion mounted interiorly of this end of the sleeve and a deformable metal ferrule being disposed exteriorly of this end of the sleeve, said insert and ferrule frictionally engaging this end of the sleeve and means on the first cone for engaging with the insert and for completing the mechanical coupling;

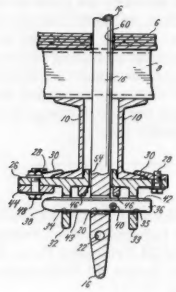
a tie rod removably mounted in the passage of the spreader means, the tie rod supporting an elongated tubular pipe slidably mounted thereon and having coupling means a. one end for releasably coupling to the loose cone of the spreader means; and

interengagable surfaces defined by the spreader means and the tie rod arranged and constructed for releasably coupling the spreader means to the tie rod so that the tie rod and spreader means are disengagable from the other while the forms are still in place and the tie assembly can be disassembled after use and removed from the concrete without damage to the concrete and tie assembly.

3,927,858
CLAMP FOR TIE ROD WITH STRESS-RELIEVING MEANS

Norman R. Underhill, 1933 Karlin Drive, Village of Town and Country, Mo. 63131

Filed Nov. 29, 1973, Ser. No. 420,273
Int. Cl.² E04G 17/08
U.S. Cl. 249—219 R 14 Claims

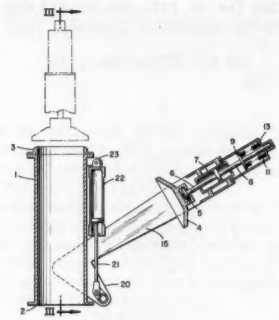


1. A tie rod clamp for a concrete form having a clamp base attachable to said concrete form, a tie rod holding means which can be moved into a position wherein a portion thereof extends through an opening in a tie rod that is used with said concrete form, at least one restraining projection on said clamp base which defines a space to receive another portion of said tie rod holding means whenever said tie rod holding means is in said position and thereby restrain said tie rod holding means, and hence said tie rod, against substantial rotational movement relative to said clamp base, and stress-relieving means pivotable about a point on said clamp base, said stress-relieving means being pivotable into a position in engagement with said tie rod holding means and also in engagement with said clamp base wherein said stress-relieving means and said tie rod holding means can coact to transmit forces from said clamp base to said tie rod, said tie rod holding means being movable into its said position wherein said other portion thereof is within said space in said one restraining projection and the first said portion thereof extends through said opening in said tie rod and said stress-relieving means being pivotable into its said position in engagement with said tie rod holding means and also in engagement with said clamp base prior to the placement of concrete in said concrete form, said form responding to said placement of concrete therein to tend to move said clamp base in a predetermined direction relative to said tie rod, said stress-relieving means cooperating with said tie rod holding means whenever said stress-relieving means and said tie rod holding means are in their said positions and said concrete form tends to move said clamp base in said predetermined direction relative to said tie rod to transmit forces from said clamp base to said tie rod, whereby said stress-relieving means and said tie rod holding means and said tie rod can coact to limit movement of said clamp base in said predetermined direction relative to said tie rod in response to said placement of concrete in said concrete form, said tie rod developing axially-directed stresses therein and said tie rod holding means and said stress-relieving means developing stresses therein as said stress-relieving means and said tie rod holding means coact to transmit said forces from said clamp base to said tie rod in response to the tendency of said clamp base to move in said predetermined direction relative to said tie rod in response to said placement of concrete in said concrete form, said stress-relieving means being pivotable out of its said position and hence being movable relative to said tie rod holding means and relative to said clamp base to relieve said axially-directed stresses in said tie rod and to relieve said stresses in said tie rod holding means and thereby facilitate movement of said tie rod holding means relative to said tie rod.

3,927,859
BLOW OFF VALVE FOR A BLAST FURNACE

Cornelis Raaphorst, Heerhugowaard, Netherlands, assignor to Hoogovens Ijmuiden, B.V., Ijmuiden, Netherlands

Filed Dec. 18, 1973, Ser. No. 425,822
Claims priority, application Netherlands, Dec. 22, 1972, 7217481
Int. Cl.² F16K 1/24
U.S. Cl. 251—147 6 Claims



1. Blow-off valve of a blast furnace closing an end of a conduit through which hot pressurized gas is vented on opening of the valve, the valve having,

a. a valve seat at the conduit end,

b. a closure member movable into and out of engagement with the seat,

c. biassing means resiliently biassing the closure member against the seat,

d. lifting means operable to move the closure member away from the seat against the force of the biassing means, and

e. a U-shaped yoke embracing the conduit and pivotally mounted for pivoting about an axis which is fixed in relation to the conduit and is spaced longitudinally along the conduit from the end, the closure member, biassing means and lifting means being carried by the yoke so that they can be moved out of the venting gas stream by pivoting of the yoke on opening of the valve, said lifting means comprise a hydraulic cylinder and piston assembly having a piston rod connecting the closure member to the piston, the cylinder being mounted on the yoke, said biassing means comprise a plurality of disc springs located in a spring box mounted on the yoke beyond the cylinder from the closure member, the springs acting to transmit the biassing force between the spring box and an abutment secured to an extension of the piston rod.

3,927,860
REMOTE CONTROL DRAIN VALVE

Franklin G. Smith, and Gerald M. Wilson, both of Portland, Oreg., assignors to Northwest Marine Products, Inc., Portland, Oreg.

Continuation of Ser. No. 456,536, April 1, 1974, abandoned, which is a continuation of Ser. No. 277,234, Aug. 2, 1972, abandoned. This application Jan. 10, 1975, Ser. No. 540,282
Int. Cl.² F16K 1/16
U.S. Cl. 251—299 5 Claims

1. A drain valve comprising:

means defining a valve seat including a rim surrounding a drain passage,

a movable valve plug adapted for seated engagement with said rim to close said passage,

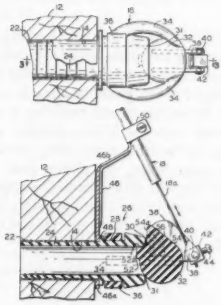
and plug-operating means selectively operable to roll said plug on said rim into and out of seated engagement to open and close said drain passage,

said valve seat including a tubular valve seat member defining an extension of said drain passage, said member including said rim and a neck portion axially inwardly of said rim, and resilient means interconnecting said plug and said neck portion in a manner urging said plug into engagement with said rim,

said valve plug comprising a generally spherical resilient elastomeric valve ball, said resilient means comprising a pair of resilient elastomeric arms extending from opposite sides of said ball to an elastomeric collar, said collar encircling said neck portion of said seat member at a position spaced axially inwardly from said rim so that said arms urge said ball into seated engagement with said rim to seal said passage,

said arms, collar and ball being integral with one another and said arms being connected to upper central portions of said ball so as to bias said ball both in a seated position and in an unseated over-center position upon movement of said ball to said positions by said operating means,

said valve ball having a projecting claw portion extending along an inner wall of said drain passage and a projecting ear portion extending over an outer surface of said rim when said ball is seated on said rim, said claw and ear



portions together projecting from a common quadrant of said ball and being positioned to act against a common sector of said rim, said claw and ear portions having intersecting shoulders for facilitating the pivoting of said ball between predetermined seated and unseated positions on said rim upon actuation of said operating means.

4. A drain valve comprising:

means defining a valve seat including a rim surrounding a drain passage,

a movable valve plug means adapted for seated engagement with said rim to close said passage,

and plug-operating means selectively operable to roll said plug means on said rim into and out of seated engagement to open and close said drain passage,

said means defining a valve seat including a tubular valve seat member having an adapter portion extending in a force fit within said drain passage to secure said seat member to a body defining said drain opening, and a neck portion extending axially outwardly of said passage between said rim and said adapter portion, said plug-operating means including a control cable means connected to said plug means, and cable-mounting means extending in surrounding relationship to said neck portion for swiveling movement about said seat member to enable proper operating alignment of said cable means with said plug means.

3,927,861

APPARATUS FOR DRIVING SHEET PILES INTO THE GROUND

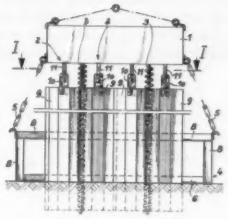
Fritz Dumont, Dortmund-Persebeck, Germany, assignor to Baugesellschaft Klammt KG, Hagen, Germany

Division of Ser. No. 448,764, March 6, 1974. This application Oct. 29, 1974, Ser. No. 519,024

Claims priority, application Germany, Mar. 10, 1973, 2312032; Feb. 9, 1974, 2406237

Int. Cl.² E02D *5/22*

U.S. Cl. 254—29 R **13 Claims**



1. An apparatus for driving sheet pile planks or the like into the ground, comprising in combination:

a. a transverse head disposed above the ground where the planks are to be driven in, said transverse head having a length dimension along which the planks are driven in a row below the transverse head;

b. a plurality of plank pressing devices supported by and spacedly suspended from said transverse head;

c. means for connecting said pressing devices with the planks;

d. a framework disposed below said transverse head and extending along the ground beyond the length of said transverse head; and

e. releasable coupling means carried by said framework for temporarily and selectively clamping individual planks to said framework; said coupling means including means for clampingly engaging the planks when they are urged out of the ground by pulling forces and for automatically releasing the planks when they are urged into the ground by plank pressing forces.

3,927,862

MANUAL OR POWERED SINGLE-LEVER HAUL-IN AND HAUL-OFF APPARATUS

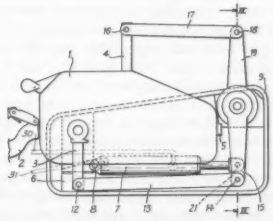
Michel Cavalieri, Neuilly-sur-Marne, France, assignor to Sedit, Bagnolet, France

Filed Nov. 27, 1974, Ser. No. 527,872

Claims priority, application France, Dec. 18, 1973, 73.45223

Int. Cl.² B66F *3/00*

U.S. Cl. 254—76 **5 Claims**



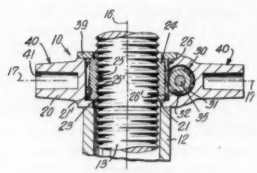
1. In a cable hauling apparatus with actuating mechanism, wherein said hauling apparatus has a pair of oscillating actuat-

ing levers disposed in different planes with a first actuating lever of said pair controlling hauling in of a cable passing through the apparatus while the second actuating lever of said pair controls the hauling off of said cable, and wherein said actuating mechanism comprises a single control lever, a control shaft rigid with said control lever for receiving therefrom an alternative rotating movement, and a pair of crank arms pivotally mounted about said control shaft, mechanical means capable of transmitting the movement of said single control lever to said first and second actuating levers through said pair of crank arms, said mechanical means including a shift member slideably mounted on said control shaft between said pair of crank arms, said shift member being capable of selectively engaging one crank arm of said pair of crank arms and coupling said single control lever to said crank arm and consequently to the corresponding actuating lever of the hauling apparatus.

3,927,863
TRANSPORTABLE JACK

George Polsky, 6704 Merton Road, Cote St. Luc, Montreal, Quebec, Canada

Filed Sept. 3, 1974, Ser. No. 502,803
Int. Cl.² B66F 3/18
U.S. Cl. 254—103 8 Claims

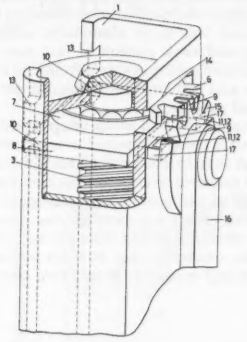


1. A transportable jack adapted to be positioned in frictional support engagement with an end of a hollow support shaft and for longitudinal displacement of a helical threaded bolt extending from said end of said hollow support shaft, said jack comprising a housing having a through bore therein, a ring gear movably retained in said housing concentrically with said through bore, said ring gear having a vertical inner and outer annular wall, said inner annular wall having a helical thread formed throughout, a drive gear retained in said housing and having at least one engageable end for imparting an axial rotational drive to said drive gear, said drive gear being in driving engagement with said outer wall of said ring gear to impart a circumferential drive to said ring gear, engaging means secured to said housing to prevent said housing from rotation about said bolt when an axial rotational drive is imparted to said drive gear, said ring gear helical thread being threadably engaged with said bolt whereby said jack rests on a circumferential end of said support shaft with said bolt freely extending within said hollow support shaft, said threaded bolt being displaced longitudinally with respect to said support shaft by rotating said engageable end of said drive gear whilst maintaining said housing substantially stationary by said engaging means.

3,927,864
LIFTING JACK

Jurgen Meierkort, Wiedenest, and Peter Schafer, Gummersbach, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,832
Claims priority, application Germany, Jan. 28, 1974, 2403853
Int. Cl.² B66F 3/18
U.S. Cl. 254—103 7 Claims

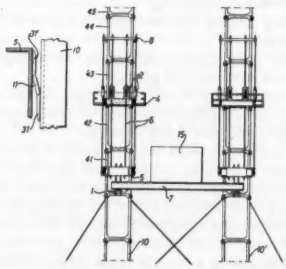


1. A jack comprising a guide housing, a nut, said guide housing including an inside adapted to secure the nut against twisting, a jack arm pivotally connected to the nut, a lifting spindle arranged in the guide housing in engagement with the nut, the nut including means enabling it to be axially moved in cooperation with the lifting spindle, a spur gear, means inside the guide housing supporting the spur gear, a pinion gear, means connecting the pinion gear to a crank handle, means connecting the spur gear to the lifting spindle inside the guide housing and means including slots in the guide housing through which the spur gear projects out of the guide housing to engage the pinion gear.

3,927,865
APPARATUS FOR LIFTING OF HEAVY LOADS

Carl-Heinrich Teodor Blankenburg, Trosa, Sweden, assignor to Wikstrom International AB, Stockholm, Sweden

Filed Jan. 23, 1974, Ser. No. 435,818
Claims priority, application Sweden, Jan. 29, 1973, 7301208
Int. Cl.² B66F 1/00
U.S. Cl. 254—105 11 Claims



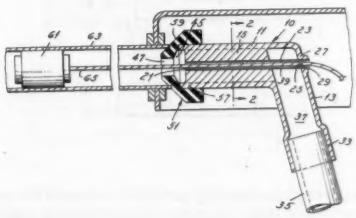
1. Apparatus for lifting and/or lowering a heavy load (15) in a plurality of stages along at least one climbing mast (10,10'), comprising:

at least one climbing mast (10,10');
a plurality of climbing rods (6);
a climbing frame (4);
a plurality of climbing members (2) mounted to said climbing frame (4), each climbing member (2) cooperating with a respective climbing rod (6) for lifting and/or lowering said climbing frame (4) relative to said at least one climbing mast (10,10');
a load frame (5) carrying at least a part of the load (15) and being coupled to and below said climbing frame (4);
a stage support (8) cooperatively coupled via respective climbing rods (6) with said climbing frame (4);
at least one support cleat (31) mounted to said at least one climbing mast (10,10'); and
connecting means (11) for selectively engaging said at least one cleat (31) with at least one of said frames (4,5) and stage support (8) so as to carry the load on said at least one cleat (31) for at least a portion of a complete stage lifting period, a stage lifting period comprising the period for moving the load over a complete section of said at least one climbing mast (10,10'), thereby relieving the load from said climbing rods (6).

3,927,866
PNEUMATIC BLOW GUN FOR INSTALLING FISHING LINE, MEASURING TAPE AND POLYETHYLENE PULL LINE IN ELECTRICAL CONDUIT

Wayne A. Linquist, Rockford, Ill., assignor to Greenlee Bros. and Co., Rockford, Ill.

Filed Oct. 11, 1974, Ser. No. 513,989
Int. Cl.² E21C 29/16
U.S. Cl. 254—134.4 4 Claims

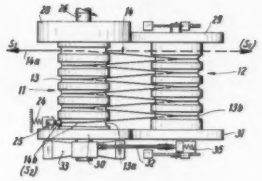


1. A pneumatic blow gun comprising:
a. a main body portion including
   1. a tubular wall;
   2. an outer end;
   3. an inner end; and
   4. a longitudinal axis extending through said main tubular body portion;
b. a leg portion extending from said main tubular body portion at said inner end;
c. rib means connecting the inner walls of said main tubular body portion, said rib means forming a channel means;
d. a guide tube extending through said axis of said main tubular body portion and said rib means, said guide tube extending through the wall at said inner end of the main body portion; and,
e. a centrally open adapter cone shaped and dimensioned to detachably encircle said outer end of said main body portion to form a seal therewith.

3,927,867
DOUBLE DRUM WARPING AND MOORING WINCH HAVING SELF-TAILING MEANS DRUM BIASING LINKAGE

Johannes Herchenroder, Varrelgraben, Germany, assignor to Friedrich Kocks GmbH, Bremen, Germany

Filed Aug. 21, 1974, Ser. No. 499,343
Claims priority, application Germany, Aug. 25, 1973, 2343073
Int. Cl.² B66D 1/76
U.S. Cl. 254—175.7 8 Claims

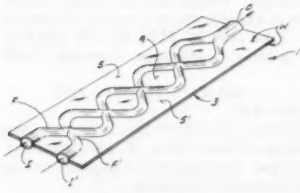


1. In a winch apparatus for warping and mooring ships including two grooved drums 11, 12 for hauling in and paying out a rope 14 on input and output sides, respectively, and having stowing means 16 for accommodating the rope end 14*b* which is paid off from the output side of the winching apparatus and which is distal with respect to the load or input side, and on which a tractive pull S_2 is applied, the improvement characterized by means incorporated directly in the winch apparatus for applying the tractive pull on the rope end at the output side, one of the drums being driven from the outside and the drive being transmitted by pairs of friction wheels to the other drum, the friction wheels being additionally thrust against each other by spring force, such that the friction wheels 28, 29, 30, 31 are joined to each other by tie bars 32 which are retained under stress in the sense of pressing the friction wheels 28–31 against each other by means of compressing springs 35.

3,927,868
STATIC-TYPE MIXER, AND RECEPTACLE AND METHOD OF PACKAGING UTILIZING SAME

Thomas B. Moore, 32 Progress Parkway, Maryland Heights, Mo. 63043

Filed May 28, 1974, Ser. No. 473,415
Int. Cl.² B01F 5/00
U.S. Cl. 259—4 11 Claims

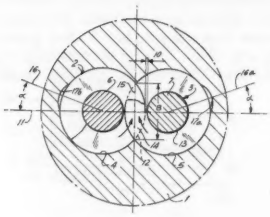


1. Mixing means comprising a disposable static-type mixer having two opposed walls of sheet material, said walls being secured to one another in a pattern such as to establish a flow path therebetween having a plurality of inlets at one end thereof for entry of the materials to be mixed, an outlet at the other end thereof for exit of the mixture, and a plurality of flow passages between the inlets and the outlet with said flow passages crossing one another at a plurality of intersections between said inlets and said outlet for mixing of the materials flowing through said passages to the outlet.

3,927,869
MULTISCREW EXTRUDER

Wilhelm Hanslik, Vienna, Austria, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Sept. 24, 1973, Ser. No. 400,059
Claims priority, application Germany, Sept. 27, 1972, 2247286
Int. Cl.² B29B 1/10
U.S. Cl. 259—192 8 Claims



1. In an extruder for thermoplastic materials comprising a housing with a plurality of axially extending cylindrical chambers intercommunicating through a passage of a width less than the chamber diameter, and a like plurality of feed screws rotatable to drive a plastic mass in said chambers toward a discharge end of the housing, said feed screws intermeshing with one another at said passage and defining an entrance side and an exit side for said passage, the improvement wherein said housing is provided in the vicinity of said discharge end with at least one axially extending shallow peripheral recess in each of at least two of said chambers at a location remote from the entrance side of said passage for counteracting a lateral thrust exerted by said mass upon the corresponding feed screw, said recess being a single continuous groove spanning a multiplicity of turns of the threads of said corresponding feed screw and being of such shape and dimension that the thermoplastic material being extruded will flow easily into and out of said recess and will not lodge therein.

3,927,870
DEVICE FOR THE INDUCTIVE HARDENING OF WORKPIECES WHICH CAN BE ROTATED AROUND A REVOLVING AXIS

Gerhard Seulen; Friedhelm Reinke, both of Remscheid, and Edgar Stengel, Wuppertal-Hahnerberg, all of Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid, Germany

Filed June 26, 1974, Ser. No. 483,452
Claims priority, application Germany, July 5, 1973, 2334126
Int. Cl.² C21D 9/30, 1/42
U.S. Cl. 266—4 E 5 Claims

1. An apparatus for inductively hardening workpieces of the type in which different parts of the surface are heated by different shaped inductors which partially surround the surface to be hardened comprising:

means for mounting a plurality of said workpieces for axial rotation and for indexing movement between a plurality of treating positions including a hardening position,

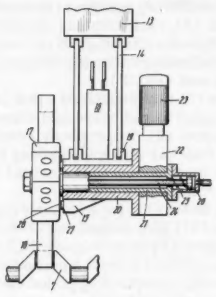
a plurality of different shaped inductors,

a carrier spider mounting said inductors for presenting one of said inductors to a workpiece mounted in said hardening position,

a transformer,

means for removably coupling said inductor in said hardening position to said transformer,

means for rotating said carrier spider about a given axis to sequentially present each of said inductors to a workpiece, and

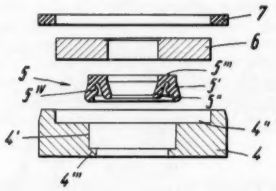


means for moving said carrier spider along said given axis to uncouple said inductor from said transformer.

3,927,871
COVER PLATE FOR CYLINDERS HAVING SEALED PISTON ROD GUIDES

Johannes J. de Baan, Ennepetal-Ruggeberg, Germany, assignor to Firma August Bilstein, Ennepetal, Germany

Filed Oct. 4, 1974, Ser. No. 511,736
Claims priority, application Germany, Oct. 12, 1973, 2351309
Int. Cl.² F16F 5/00
U.S. Cl. 267—65 R 7 Claims



1. In a cover plate assembly particularly adapted for use in a hydropneumatic shock absorber, the combination comprising a cylinder having a reciprocally movable piston rod extending therefrom in fluid sealing relation and having an inwardly projecting support disposed on an inner peripheral wall portion; an inner temperature-resistant plastic disc supported on such support in said cylinder; a sealing element traversed by said piston rod and received in a central bore portion in said inner disc; an outer metal disc contiguous with a face portion of said inner disc and a face of said sealing element adapted to guide said piston rod and reinforce said plastic disc against bending forces in the normal course of piston rod movement; an outer, deformable annular sealing ring concentric with said piston rod and metal disc and supportingly disposed on an annular portion of said inner plastic disc; said supporting annular portion of said inner plastic disc initially being of lesser area than the surface of the outer annular sealing ring supported thereon; an inwardly projecting edge portion of said cylinder overlying peripheral portions of said metal disc; said outer sealing ring being urged by said cylinder edge portion against the outer periphery of said outer metal disc and the supporting annular portion of said inner plastic disc so as to be deformed and fill the annular volume defined by said inner plastic disc, said outer metal disc and the inwardly projecting cylinder edge portion; the interval between said inwardly projecting edge portion and said cylinder pro-

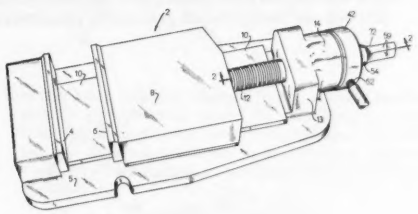
jecting support being such that said metal disc, sealing ring and inner plastic disc are urged into a close-packed, substantially fluid-tight relation.

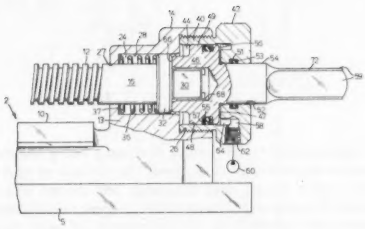
3,927,872

VISE INCLUDING FLUID PRESSURE CLAMPING MEANS

Donald W. Sessody, Brookfield, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed May 19, 1975, Ser. No. 578,640
Int. Cl.² B23Q 3/08
U.S. Cl. 269—32 7 Claims





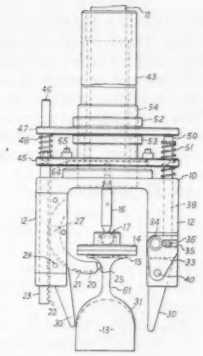
1. A workholding vise of the type having a base, a fixed jaw at one end of said base and a shiftable jaw slideably mounted on said base, a fixed thrust reaction member fixed to said base at the end thereof opposite to said fixed jaw, a threaded lead screw extending from said reaction member and engagable at one end with said shiftable jaw for positioning the latter relative to said fixed jaw, a housing attached to and extending from said reaction member and having a bore and a larger opening concentric therewith, a coupling securely engaged in said opening, said coupling having a bore therein which is concentric with said bore in said housing, said lead screw being slideable in said bore of said housing, and a piston located in said coupling and having an end extending therefrom, said end having means for attachment to an adjusting handle for rotating said piston, means for connecting said piston and said lead screw whereby rotation of said piston also rotates said lead screw and whereby said lead screw can move axially relative to said adjusting member, said piston slideably located in the bore of said coupling to thereby form an expansible fluid chamber therewith, passage means extending to said chamber and through said coupling for introducing a pressurized fluid to said chamber to thereby cause axial sliding movement of said piston in said coupling and consequent axial movement of said lead screw whereby said shiftable jaw can be brought into clamping engagement with said fixed jaw.

3,927,873

SELF-CENTERING CHUCK

Arnold Chambers, Chesterfield, England, assignor to Glass Tubes and Components Limited, Chesterfield, England

Filed July 22, 1974, Ser. No. 490,581
Claims priority, application United Kingdom, Aug. 9, 1973, 37846/73
Int. Cl.² B25B 1/20
U.S. Cl. 269—154 10 Claims



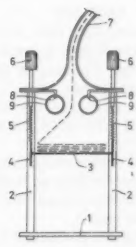
1. A chuck comprising a body, a foot attached to the body, a first set of movable jaws for holding a workpiece against the foot, each of the jaws of the first set being of arcuate shape and carrying a series of gear teeth in its outer edge, a second set of movable jaws for centering the workpiece upon the chuck, said second of jaws being further from the foot than the first set of jaws, means coupled to said first and second sets of jaws for moving the jaws inwardly and outwardly, said means comprising a plurality of racks each engaging with the teeth of one of the jaws of the first set, and resilient biassing means urging the jaws of the first set resiliently towards the foot, whereby while the workpiece is resiliently held by said first set of jaws the workpiece is shifted into a centred position by said second set of jaws.

3,927,874

PAPER STACKER

Anthonius Theodorus Maria Buisman, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 347,805, April 4, 1973, abandoned.
This application Oct. 18, 1974, Ser. No. 516,003
Claims priority, application Netherlands, Apr. 15, 1972, 7205113
Int. Cl.² B65H 45/00
U.S. Cl. 270—61 F 2 Claims



1. A paper stacker for feeding prefolded paper having a perforation track on both sides thereof to a paper collecting table comprising a guide which opens above the table and

which feeds the paper to fold on the table during operation, means resiliently supporting and guiding said table so as to be movable with respect to said guide, said table having side portions parallel to the perforation tracks of the folded paper and a raised portion extending along the entire length of said table receiving said papers, said raised portion being located between and having a longitudinal axis substantially parallel to said side portions.

3,927,875

APPARATUS FOR LAYING A FILM WEB IN Z-SHAPED FOLDS OR FOR DEPOSITING PORTIONS OF FILM WEB IN OVERLAPPED CONFIGURATION

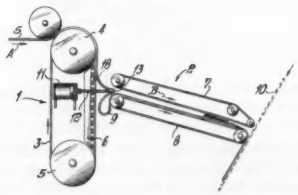
Aloys Winnemoller, Rhine, and Friedrich-Franz Brockmuller, Lengerich, both of Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed May 8, 1974, Ser. No. 468,081

Claims priority, application Germany, May 9, 1973, 2323433

Int. Cl.² B65H *45/22*

U.S. Cl. 270—83 **8 Claims**



1. Device for laying a film web in Z-shaped folds and optionally for the overlapped positioning of sections cut from said film web, or for inserting sections of film, comprising: a first conveyor means conveying at a high speed; a second gripping conveyor means with clamping capacity operating at a conveying speed slower than that of the first conveyor means disposed to convey at an angle to the conveying direction of said first conveyor means and said angle having its intercept on the first conveyor means, the second conveyor means having an entry nip located at a distance from the first conveyor means and opening toward the first conveyor means; an extendable pusher means adapted to pass through the conveyor plane of the first conveyor means and reach as far as the opening of the entry nip of the second conveyor means, the first conveyor means having adhering means for adhering said film web to the first conveyor means in at least the region of its travel which is opposite the opening of the entry nip, the adhering means causing the film web to be held firmly on the first conveyor means until drawn away by the action of introducing the forward fold edge of the Z-shaped fold into the entry nip.

3,927,876

DEVICE FOR SINGULATING DOCUMENTS

Edward A. Wojtowicz, Bryn Mawr; S. James Lazzarotti, Broomall, and Paul E. Tartar, Chester, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 23, 1974, Ser. No. 535,731

Int. Cl.² B65H *1/02, 3/06, 3/10, 7/14*

U.S. Cl. 271—10 **18 Claims**

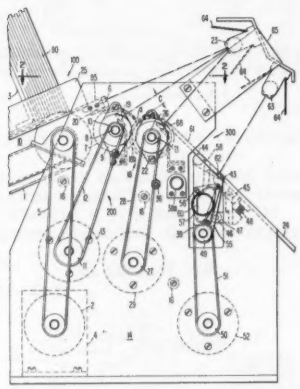
1. A document feeding device comprising:

drop ledge means for performing an initial separation on a stack of documents being pushed from said ledge means by moving transports means,

moving friction roller means positioned in proximity to said drop ledge means for receiving and transporting on its surface the documents which drop thereon,

vacuum roller means positioned in a proximate intersecting manner with said friction roller means and being adapted to perform a final separation on said documents, means for terminating the movement of said friction roller means at a predetermined point in the travel of a given document on its surface, said termination of movement permitting the leading edge of said last mentioned document to contact the periphery of said vacuum roller means at the roller means intersection point, said vacuum roller means being adapted to transport said document on its surface and being operatively connected to a vacuum source for exerting a vacuum force upon said document as it traverses a predetermined point on the circumference of said roller means,

a ramp including takeaway belt means positioned in proximity to said vacuum roller means and in tangential relationship with said predetermined point on the circumference



of said vacuum roller means, said ramp being adapted to receive documents exiting from the surface of said vacuum roller means, said takeaway belt means including means for exerting a vacuum force upon said document, means for terminating the movement of said vacuum roller means in response to the attainment of control of said document by said last mentioned vacuum force, said document being acted upon simultaneously by the respective vacuum forces of said vacuum roller means and said takeaway belt means, the vacuum force exerted by the latter means being of greater magnitude than that of the former means and being effective in stripping said document from the surface of the stationary vacuum roller means, said takeaway belt means accelerating said document along said ramp.

3,927,877

PAPER FEED TRAY FOR USE WITH COPYING MACHINE AND THE LIKE

Yasuhiko Terajima, Chigasaki, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1973, Ser. No. 419,331

Claims priority, application Japan, Apr. 20, 1973, 48-46576

Int. Cl.² B65H *3/18*

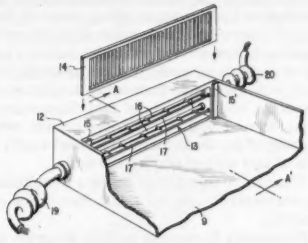
U.S. Cl. 271—11 **6 Claims**

1. A paper feed device for use with a copying machine or the like, said device comprising:

a tray for containing a stack of copy paper;

charging means for applying electric charge to at least the side of said stack to separate the sheets of copy paper from one another and thus lessen the probability of the sheets being double fed to the copying machine;

a potential source for said charging means;
feeding means for feeding said sheets from said tray to said copying machine; and

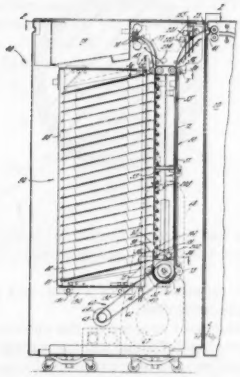


said tray being slideably disposed in said copying machine and the said potential source for said charging means being fixedly disposed in the copying machine, the potential source being connected to the charging means by wires of sufficient length to permit free sliding movement of said tray.

3,927,878
COLLATOR

Stanley J. Bolsenga, Evanston; Stephen S. Kotow, Franklin Park; Henry G. Reuter, Glenview, and Donald J. Volante, Chicago, all of Ill., assignors to Apeco Corporation, Evanston, Ill.

Filed Apr. 3, 1974, Ser. No. 457,440
Int. Cl.² B65H *31/24, 43/02*
U.S. Cl. 271—173 **2 Claims**



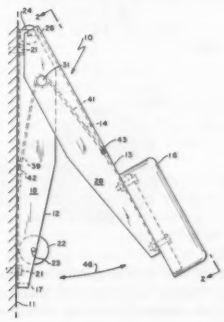
1. In a collator intended for close coupling into an office photocopy machine having means for delivery of multiple copies of an original document in a closely and evenly spaced series comprising, in combination, a frame, a tray assembly formed of a stacked tier of trays and set of commutated deflectors for deflecting copy sheets into the respective trays in sequence, a driven copy sheet conveyor for receiving copies from the photocopy machine and for conveying them to the tray assembly along an extended conveyance path in an evenly spaced series defining gaps between adjacent copy sheets and with the gaps having a reference spacing, a set of gap sensors arranged along the conveyance path for sensing the gaps, the sensors being spaced at reference spacing so that periodically all of the sensors will have momentary simultaneous response to presence of respective gaps thereby to indicate that the copy sheets are all being normally conveyed, and means triggered by failure of any gap sensor to have periodic response simultaneously with the other sensors for automatically shutting down the conveyor, the sensors being in the form of switches which are momentarily opened upon passage of gaps between adjacent sheets and in which all of the switches are connected in parallel, circuit means responsive to failure of the parallel connected circuit to periodically open for producing an output signal, and means responsive to the output signal for shutting down the conveyor.

2. A collator intended for close coupling to an office photocopy machine having means for delivering multiple copies of an original document in a closely and evenly spaced series comprising, in combination, a housing having an inlet for registering with an outlet on the photocopy machine, a tray assembly formed of a stacked tier of trays with alined entrance lips, a copy sheet conveyor for conveying copies in a closely spaced series from the inlet of the collator along a conveyor path closely adjacent the lips of the trays, deflectors at the lips of respective trays and capable upon actuation of diverting an approaching copy sheet into the associated tray, means for commutating the deflectors so that successive copies are deposited in successive trays starting with the first, an automatic shut-off timer having a time delay on the general order of 52 seconds and having a reset line, a clearance timer having a time delay on the order of 8 seconds and having a reset line, the two timers being effectively connected in series with one another so that timing out of the shut-off timer initiates timing in the clearance timber, means controlled by timing out of the clearance timer for turning off the conveyor, a sensor adjacent the inlet and connected to the reset line of the shut-off timer for sensing arrival of a copy sheet at the inlet so that the shut-off timer is ineffective as long as the period of adjacent copy sheets is less than the time delay for which it is set, but with a period of greater duration serving to initiate timing by the clearance timer so that upon passage of an additional eight seconds the conveyor is turned off, and means including a manual "off" control effectively interposed between the shut-off timer and the clearance timer for directly initiating timing by the clearance timer so that the conveyor is turned off approximately 8 seconds after pressing of the "off" control thereby to insure that any copies being conveyed within the collator by the conveyor have an opportunity to clear the conveyor before the latter stops its motion.

3,927,879
PUNCHING BAG SIMULATOR

Leo E. Long, and Edward H. Phillips, both of Los Altos, Calif., assignors to American Fitness, Inc., Los Altos, Calif.

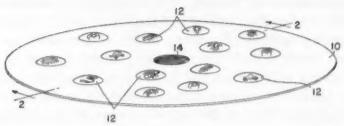
Filed Dec. 11, 1974, Ser. No. 531,520
Int. Cl.² A63B *69/00*
U.S. Cl. 272—76 **5 Claims**



5. A punching or speed bag simulator comprising a base member having provisions for mounting upon a stationary surface, a pivot arm, means serving to pivotally interconnect said pivot arm to said base member, return spring means

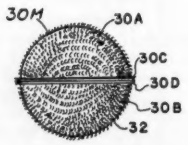
acting between said base member and said pivot arm and being positioned for biasing said pivot arm in a rest condition so that one end portion of said arm is disposed outwardly and away from said base, first and second bumper means being interposed between said pivot arm and said base member, said first bumper means being positioned between said one end portion of the pivot arm and said base member and being formed from a resilient material and sized to absorb the excess kinetic energy imparted to said pivot arm, said second bumper means being positioned between the other end portion of said pivot arm and said base member, and being formed of a material serving to dampen the tendency of said pivot arm to bounce and rebound from the punching action, a punching bag element secured to said pivot arm adjacent to said one end and being configurated to serve as a target for the human fists and means acting with said pivot means serving to maintain the movement of said pivot arm substantially entirely in a path normal to the pivot axis upon impact of said punching bag element with the fists.

3,927,880
STEP ON BUG GAME
Victor Petrusek, 18511 Gottschalk, Homewood, Ill. 60430
Filed Apr. 8, 1975, Ser. No. 566,522
Int. Cl.² A63B 67/00
U.S. Cl. 273—1 E **5 Claims**



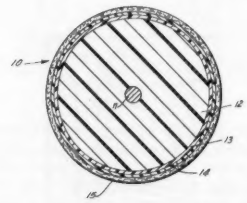
1. A game comprising in combination a portable flat sheet, having a plurality of integral bulges randomly formed about the surface of the sheet, an alarm under one of the bulges, circuit closing switch means under another bulge, electrically connected to said alarm, so that when the bulge having the switch thereunder is stepped on by a contestant, the alarm will sound.

3,927,881
INTEGRALLY FORMED PROJECTILE AND HOOK-LIKE FASTENERS
Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840, and Allan M. Elfman, 219 E. 83rd St., New York, N.Y. 10028
Continuation-in-part of Ser. No. 436,045, Jan. 24, 1974, Pat. No. 3,857,566. This application May 20, 1974, Ser. No. 471,760
Int. Cl.² A63B 71/02
U.S. Cl. 273—58 K **3 Claims**



1. A missile for use in dart games and the like, which dart games employ a target composed of a material having a surface defined by a multitude of tiny plastic hook-like formations adapted to releasably retain said missile thereagainst comprising:
a lightweight hollow body having a thin wall defining a convex outer surface configuration and forming a self-supporting bulbous enclosure of plastic,
a multitude of filamentary formations formed of the same plastic as that which comprises said hollow body and integrally molded with the wall of said hollow body,
said filamentary formations being cantilever supported by said hollow body and protruding outwardly from said wall of said hollow body with which they are molded,
each of said filamentary formations having a narrow shank which extends upwardly and outwardly from said hollow body with which said filamentary formations are molded, the outer ends of each of said filamentary formations being formed with a hook-like portion which extends laterally of the shank thereof and backwardly in the direction of said wall of said hollow body,
said filamentary formations defining a multitude of engaging elements for the hook-like formations of the target material,
said filamentary formations molded integrally with the wall of said missile being provided in sufficient number and distributed around the surface of said wall of said missile in a manner to retain said missile against the surface of said target containing said plastic hook-like formations which it is directed against regardless of which portion of said missile containing said filamentary formations strikes said target.

3,927,882
INDOOR SOCCER BALL
Ernesto Felix Galarza, 120 S. Main St., South Toms River, N.J. 08753
Continuation-in-part of Ser. No. 370,598, June 18, 1973, abandoned. This application Jan. 6, 1975, Ser. No. 538,930
Int. Cl.² A63B 37/02
U.S. Cl. 273—65 E **6 Claims**



1. A soccer ball for use indoors comprising:
a. an inner substantially solid spherical core of aluminum foil,
b. an outer spherical core of a light, soft plastic material around the inner core,
c. at least two inner covers over the outer core, said covers being composed of a thin knitted material, and
d. an outer cover of a heavier material selected from wool, cotton, or leather.

3,927,883
BOXING APPARATUS FOR FIGURE TOYS
Denis Vernon Bosley, Palos Verdes Peninsula, and Alan Ralph Pitkanen, Manhattan Beach, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 6, 1975, Ser. No. 538,699
Int. Cl.² A63F 9/14
U.S. Cl. 273—85 B **8 Claims**

1. In a boxing apparatus toy for use with a boxer figure toy, the improvement which comprises:
a base member;
a platform member movably connected to said base member;
means for producing relative motion between said base member and said platform member;

upright pedestal means hingeably connected to said platform member for providing a support for a boxer figure toy; and

release means associated with said pedestal means and said base for preventing hinged motion of said hinged pedestal means when said platform is in a first range of positions with respect to said base and for permitting hinged motion of said pedestal means to a non-upright position

when said platform is in a second range of positions with respect to said base,

whereby a boxer figure toy supported by said pedestal means is rigidly supported in a substantially upright position when said platform is within said first range of positions and therefore is invulnerable if hit, and

whereby said figure toy may fall to a knocked-down position when said platform is within said second range of positions and therefore is vulnerable if hit.

3,927,884

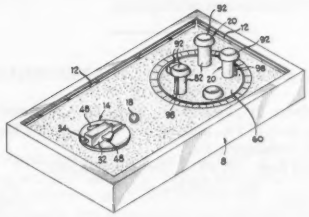
SURFACE PROJECTILE AMUSEMENT DEVICE

Marvin I. Glass, Chicago; Howard J. Morrison, Deerfield, and Ira B. Gilford, Highland Park, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Continuation of Ser. No. 297,291, Oct. 13, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,578

Int. Cl.² A63D *3/02*

U.S. Cl. 273—119 R **6 Claims**



2. An amusement game device, comprising: means defining a playing surface upon which a playing object may be propelled, with bumper rail means bounding the playing surface substantially thereabout; a playing object to be propelled upon said playing surface; a playing object propelling device located in proximity to said playing surface so as to be capable of propelling a playing object upon said playing surface, said propelling device being pivotable about a predetermined arc whereby said propelling device can effect propelling of said playing object in various directions upon said playing surface; a cluster of target members mounted on a rotatable member pivotally mounted on said playing surface for selective rotation about a generally vertical axis spaced from the target member; scoring means extending in an arcuate pattern adjacent the path of movement of said target members for registry with the target members when said rotatable member comes to rest; and means for randomly stopping said rotatable member after rotation is initiated, including detent means so as to bring the target members to discrete rest, target positions in registry with discrete portions of said scoring means.

3,927,885

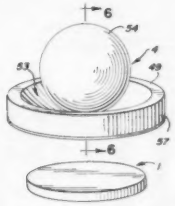
PUCK AND BAT FOR AN AIR CUSHION TABLE GAME

Phillip E. Crossman, Ada; Robert C. Kenrick, Grand Haven, and Robert W. Le Mieux, Spring Lake, all of Mich., assignors to Brunswick Corporation, Skokie, Ill.

Division of Ser. No. 179,659, Sept. 13, 1971, Pat. No. 3,773,325. This application Sept. 17, 1973, Ser. No. 397,697

Int. Cl.² A63F *3/00*

U.S. Cl. 273—126 R **8 Claims**



1. In combination, a bat and a puck for rapid play upon an air bed game table playing surface,

the puck being made of high-density plastic and comprising a first low profile right circular cylinder having substantially horizontally extending top and bottom surfaces ar . an area to weight ratio sufficient to permit the puck to float on an air bed; and

the bat being made of high-density plastic and comprising:

a. a second low profile right circular cylinder having substantially horizontal extending top and bottom surfaces, said bottom surface of said second cylinder being adapted to slide upon the playing surface, the curved vertical surface of the second cylinder being adapted to hit the curved vertical surface of said first cylinder of said puck;

b. said top surface having a depression therein, said depression being substantially symmetrical about the vertical axis of said right circular cylinder; and

c. a handle attached to said second cylinder at the bottom center of said depression, the handle extending vertically out of said depression and being adapted to be held by a player for manipulation of said bat;

said depression being coaxial with said second cylinder and adapted to protect a player's fingers grasping the handle from contact with said puck or another player's bat and to lower said bat's center of gravity;

said bat and puck having the following relations:

a. said bat is substantially heavier than said puck;

b. said second cylinder is at least twice the height of said first cylinder;

c. the diameter of said second cylinder is larger than the diameter of said first cylinder.

3,927,886

BOARD GAME

Omar Day, 523 Elizabeth Road, Glen Burnie, Md. 21061

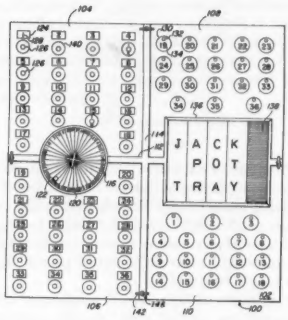
Filed Sept. 11, 1974, Ser. No. 505,095

Int. Cl.² A63F *3/00, 5/00*

U.S. Cl. 273—135 R **11 Claims**

1. In a game having a board, random selection means, sequentially designated areas, directory tokens, reward tokens, and markers, the improvement comprising: the game board having thereon a plurality of squares raised above the board, first indicia for indicating sequence in the plurality of raised squares, a respective vertical peg adjacent each raised square, a respective game chip positionable by each vertical peg, the total number of game chips being the same as the total number of raised squares and the same as the total number of vertical pegs, means for dividing the game chips into first and second distinguishable subsets equal in number, means for dividing all said raised squares and vertical pegs into two groups, second concealable indicia for uniquely associating each game chip in

the first of said two subsets with a respective game chip in the second of said two subsets a plurality of circular areas, third indicia for indicating sequence in the plurality of circular areas corresponding to the sequence in the plurality of raised squares, a plurality of markers corresponding to number of players, and means at each circular area for holding a marker, whereby players can randomly distribute the first and second sub-sets among the respectively divided groups of pegs with



said second indicia concealed, select a game chip of the first subset by means of the random selection means and the means for indicating on the raised squares, estimate which game chip of the second subset corresponds with the game chip selected, placing a marker to indicate the game chip estimated, thereafter reveal the second indicia of the game chip estimated to correspond to verify the estimate, and then take up or pay playing chips in accordance with the correctness of the estimate.

3,927,887

RECORD STYLUS

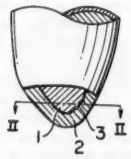
Fujio Oda, Ashiya, and Hiroshi Otani, Shijonawate, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 26, 1973, Ser. No. 427,691

Claims priority, application Japan, Dec. 28, 1972, 47-3438; Dec. 28, 1972, 47-3439; Dec. 28, 1972, 47-3440

Int. Cl.² G11B *3/44*

U.S. Cl. 274—38 **3 Claims**



1. A record stylus comprising a supporting arm; a diamond substrate secured to an end of said supporting arm; and a thin film selected from the group consisting of silicon carbide and boron carbide formed on the surface of said diamond substrate to provide a smooth surface on said diamond substrate.

3,927,888

RECORD PLAYER

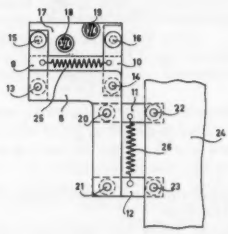
Piet van der Lely, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 26, 1974, Ser. No. 465,167

Claims priority, application Netherlands, May 5, 1973, 7306304

Int. Cl.² G11B *3/60*

U.S. Cl. 274—39 A **5 Claims**



1. A record player comprising a main frame, a sub-frame movably connected to the main frame, a turntable mounted on the sub-frame for rotation about a first axis, a tone-arm, means for suspending the tone-arm with respect to the sub-frame, and means for preventing rotation of the sub-frame with respect to the frame about a second axis parallel to said first axis wherein said rotation preventing means comprises a joining body, a first pair of joining elements each having two ends, each pivotally connected about respective axes at one end to the main frame, each pivotally connected about respective axes at the other end to the joining body, and a second pair of joining elements each having two ends, each pivotally connected about respective axes at one end to the sub-frame, each pivotally connected about respective axes at the other end to the joining body, the pivot axes being parallel and the pivotal connections of the pairs of joining elements forming the vertices of respective parallelograms.

3,927,889

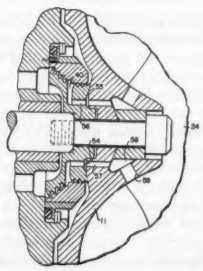
ROTATING ELEMENT FLUID SEAL FOR CENTRIFUGAL COMPRESSOR

Maurice L. Adams, Jr., Pittsburgh, and Albert A. Raimondi, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1973, Ser. No. 398,351

Int. Cl.² F16J *15/44*

U.S. Cl. 277—25 **7 Claims**



1. In a seal arrangement for a centrifugal compressor having an impeller and in which the seal formed by the surfaces of an inner seal rotor and outer seal stator includes vent passage means formed in part at least in said rotor and extending from

an intermediate location along the leakage path of the seal to an outlet located at the inlet side of the impeller, the improvement comprising:

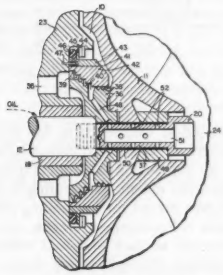
said vent passage means includes as a part thereof radially outwardly directed bore means between said rotor and said outlet of said passage means at the inlet side of said impeller to promote movement of fluid through said passage means by providing a centrifugal pumping action of said fluid in said radially outwardly directed bore means.

3,927,890

ROTATING ELEMENT FLUID SEAL FOR CENTRIFUGAL COMPRESSOR

Maurice L. Adams, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 18, 1973, Ser. No. 398,352
Int. Cl.² F16J 9/00
U.S. Cl. 277—29 **7 Claims**



1. Apparatus including a casing, and a centrifugal impeller having an inlet side, the casing having an opening therein through which a shaft for driving the centrifugal impeller projects and a seal arrangement in said opening for restricting fluid leakage from an impeller discharge pressure space on one side of the seal arrangement to a second space on the opposite side of the seal arrangement maintained in normal operation of said apparatus at substantially the same pressure as the suction pressure at the inlet side of said impeller, said seal arrangement including:

a seal rotor rotating with said shaft and having an outer face;

an annular seal stator around said rotor and having a face opposing said outer face;

the opposing faces of said rotor and stator forming a dynamic seal having one end of the axial extent of the seal exposed to said discharge pressure space and the other end of the axial extent of the seal exposed to said second space;

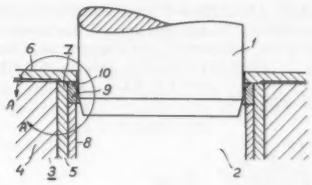
means defining a venting passage from an intermediate location along said axial extent of said seal, said venting passage extending inwardly into said rotor and to said inlet side of said impeller, said venting passage having a lower resistance to fluid flow than the resistance to fluid flow between said intermediate location along the axial extent of said seal and either end of said seal.

3,927,891

HIGH PRESSURE SEAL

Hans Larker, and Jan Nilsson, both of Robertsfors, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Apr. 19, 1974, Ser. No. 462,402
Claims priority, application Sweden, May 7, 1973, 7306349
Int. Cl.² F16J 15/16
U.S. Cl. 277—190 **7 Claims**



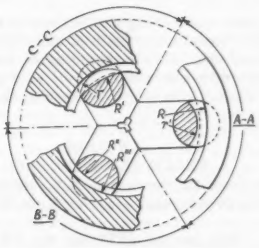
1. In a high pressure press, a seal assembly comprising a high pressure cylinder with a wall, a die or axially movable plunger projecting into the high pressure cylinder, a seal holder at the end of the high pressure cylinder, first and second sealing rings of metal, the first ring having an outer surface abutting the cylinder wall and an end surface abutting the seal holder, and the second ring having a cylindrical surface abutting the die or plunger and a surface abutting the seal holder, the first ring having grooves in the outer surface thereof forming draining channels therein extending generally longitudinally in the area nearest the seal holder.

3,927,892

MACHINE CHUCK JAWS AND THE METHOD OF MAKING THE SAME

Thaddeus T. Pradota, 6 N. 323 Andrene Lane, Itasca, Ill. 60143

Filed July 8, 1974, Ser. No. 486,387
Int. Cl.² B23B 31/04
U.S. Cl. 279—62 **8 Claims**



1. In a Jacobs-type machine chuck having a principal axis of rotation comprising a plurality of jaws each having a gripping portion and a guiding portion of cylindrical form slidably carried in the body of the chuck, the axis of the jaws being inclined to said principal axis and means to displace the jaws convergently and divergently to grip and release respectively a part to be seized in the chuck, said means comprising a ring gear having at least one tooth and rotatably carried on said body, the ring gear tooth conforming substantially to a conical helix, each jaw having a plurality of teeth to mesh with said ring gear tooth whereby rotation of the ring gear is translated into concurrent axial and radial displacement of the jaws, corresponding to convergent and divergent movement thereof, the improvement wherein the jaw teeth have a crest corresponding to a substantially frusto-conical surface having

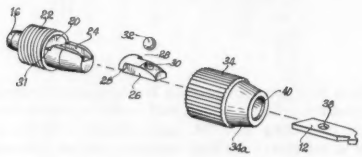
its larger radius greater than the radius of the guiding portion of the jaw and a root corresponding to a second substantially frusto-conical surface, the larger radius of the first frusto-conical surface being less at the end of the jaw which is innermost of the chuck and greater at the other end thereof, and the radius of the second frusto-conical surface being greater at the first mentioned end of the jaw than at the opposite end thereof.

3,927,893

COLLET ASSEMBLY FOR A RECIPROCATING TOOL

William Dillon, Chicago, and John A. Blachowski, Park Ridge, both of Ill., assignors to Skil Corporation, Chicago, Ill.

Filed Jan. 11, 1974, Ser. No. 432,634
Int. Cl.² B23B *31/22*
U.S. Cl. 279—75 **7 Claims**



1. A quick change collet for holding flat reciprocating tool blades of various thicknesses having engaging means thereon comprising:

a. a main channel member defining a blade receiving channel and including a first planar surface for intimately engaging said blade;

b. a ball retaining member having an aperture therethrough communicating with said channel, said retaining member receivable in said channel and forming a second planar surface intimately engaging said blade;

c. a ball received in said aperture, a portion thereof extending into said channel to contact said engaging means of said blade;

d. a collet cap threadingly engaging said main channel member and having an internally tapered wall for camming engagement with said ball and said retaining member;

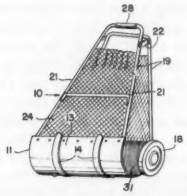
said tapered wall moving said ball and said retaining member into intimate contact with said blade as said cap is threaded onto said channel member, such that the ball and second planar surface firmly hold the blade in intimate contact with said first planar surface.

3,927,894

BEACH AND SNOW SLED

Phyllis D. Zawislak, Huntington, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 14, 1975, Ser. No. 541,004
Int. Cl.² B62B *13/18*
U.S. Cl. 280—8 **3 Claims**



1. A cart for sliding over sand or snow which may be alternately rolled over solid ground comprising

a cart section formed of sheet material, said cart section being shaped as an upwardly open-ended U-section,

a pair of tubular handle frame units each fastened to a respective upper end of said U-section, of the cart with netting fastened to the respective handle frame units to extend from the walls of the cart section,

a pair of wheels externally mounted to a first side of the cart section, and

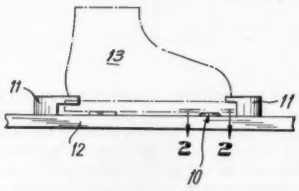
a skid mounted externally on the second side of the cart section.

3,927,895

ANTI-FRICTION RELEASE PLATE

I. Martin Spier, 50 Park Ave., New York, N.Y. 10016, and Frank B. Vener, 98 Westport Ave., Norwalk, Conn. 06851

Filed Jan. 28, 1974, Ser. No. 438,153
Int. Cl.² A63C *9/00*
U.S. Cl. 280—11.35 C **6 Claims**



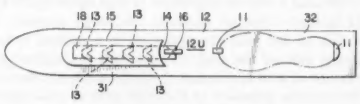
1. An anti-friction release plate for skiing comprising a plurality of rollers, roller support means including a one-piece support plate for supporting said rollers in side by side spaced relation and journal means cooperating between said rollers and roller support means for journalling said rollers for free rotation in said roller support means, each of said rollers having an external surface and said roller support means having an opening through which said external surfaces project to define a rolling surface for engagement by the sole of a ski boot.

3,927,896

SKI AND SNOW SHOE DEVICE

Vincent D. Detoia, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 21, 1974, Ser. No. 481,650
Int. Cl.² A63C *7/10*
U.S. Cl. 280—11.13 C **5 Claims**



1. A ski fitted with slidable cleats which enables the assembly to be employed alternately as a ski or as a snow shoe, comprising

a ski fitted with open slots, extending through the ski from the top surface to the undersurface of the ski, said slots located forward of the shoe mounting position of the ski, and said slots located in a line along the longitudinal axis of the ski,

a shaped flat spring member, said spring member formed of a sheet of generally rectangular shape and of a length to extend beyond the extreme longitudinal ends of the slots in the ski, with the forward end of said spring member shaped to form a flange, which flange is fastened to the top surface of the ski forward of the most forward located

slot, so that the spring member extends over the slots at a distance from the ski, with the rear end of the spring member extending past the most rearward located slot, and with the undersurface of the spring member facing the top surface of the ski and the spring member projecting above the top surface of the ski, said spring member fitted with cleats that are each in the form of a shaped block of uniform cross-section of a size to freely fit into and through a slot of the ski, with each cleat mounted to the undersurface of the spring member, with each cleat being of a transverse width to serve as a fin, when extended through the ski, and each cleat being of a height to extend from the spring member mounting through a slot in the ski and to project beyond the undersurface of the ski when the spring member is in a first fixed position, said cleats each individually mounted to the spring member in line with an individual slot of the ski in which the individual cleat fits in either said first fixed position or in a second position of the spring member so that each cleat is transversely supported by the walls of the slots, with

the free end of the cleat shaped as a generally flat surface lying in a plane generally parallel to the undersurface of the attached ski, with each cleat mounted to the undersurface of the spring member to slidably project into a slot of the ski,

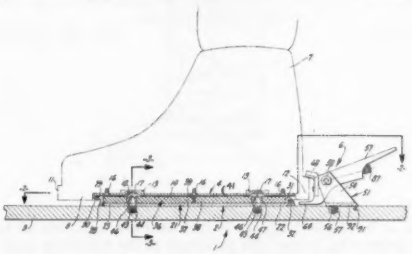
a spring retention device in the form of a clamp fastened to the top surface of the ski for holding the rear end of the spring member alternately in either a said first fixed position so that the cleats project through the slots and below the undersurface of the ski, or in a said second position in which the rear end of the spring member is held away from the ski so that the cleats are positioned in the slots, flush or above the undersurface of the ski, said clamp being in the shape of a shaped section of semi-rigid material formed with a recessed section into which an edge of the rear end of the spring member may latch in one of said positions.

3,927,897

MAGNETIC RELEASE SYSTEM FOR SNOW SKIS

Donald M. Olson, 317 Lee St., Oakland, Calif. 94610, and Michael A. McNeilly, 297 Mapache Road, Portola Valley, Calif. 94025

Filed June 24, 1974, Ser. No. 482,367
Int. Cl.² A63C *9/08*
U.S. Cl. 280—11.35 M **16 Claims**



1. A magnetic release system for snow skis comprising

A. an elongated keeper plate to be attached to the sole of a skier's boot,

B. an elongated permanent magnet structure generally coextensive with said keeper plate to be attached to a ski, and

C. separable indexing structure interposable between said plate and said magnet structure comprising

1. a low friction indexing button integral with said magnet structure and having a head portion projecting thereabove having the surface of an inclined plane exposed to said plate,

2. said head portion of said indexing button being of smaller size then said magnet structure and overlying only a limited portion thereof, and

3. a recess formed in said plate contoured in accordance with the size and configuration of said projecting head portion of said button,

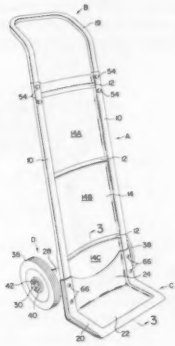
4. whereby said button and recess when interengaged resist lateral separation of said plate and magnet structure until predetermined release forces are encountered.

3,927,898

HAND TRUCK

George L. Weyrauch, Philadelphia, Pa., assignor to Gulf & Western Manufacturing Company, New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,109
Int. Cl.² B62B *1/10*
U.S. Cl. 280—47.27 **11 Claims**



1. In a hand truck having hand grip means, toe plate means, body means therebetween, and wheel means secured thereto, the improvement comprising: a closed unitary body member having channel shaped side rail portions formed integrally therein and a plurality of reinforcing rib portions formed integrally therein transverse to said rail portions to define imperforate panel areas therebetween; U-shaped hand grip means having free lower ends adapted to nest within the upper portions of said body member side rail portions; fastener means to secure said hand grip means to said side rail portions; a one piece toe plate member having side portions formed therein to nest with the lower ends of said body member side rail portions; fastener means to secure said toe plate member to said body member; axle bracket members adapted to nest with the lower ends of said body member side rail portions and adapted to be secured to said side rail portions by said toe plate fastener means; an axle non-rotatably secured to said axle bracket members and extending outboard therefrom to receive wheels thereon; and fastening means to secure said wheels on the outboard ends of said axle.

3,927,899

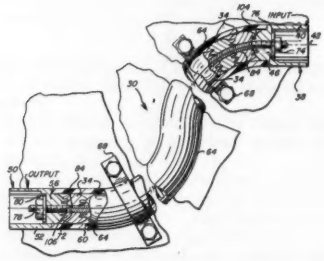
VEHICLE STEERING APPARATUS

Dale E. Bough, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 22, 1974, Ser. No. 453,871
Int. Cl.² F16C *1/02*; **B62D** *3/02*
U.S. Cl. 280—87 A **8 Claims**

1. An apparatus for use in steering a vehicle, said apparatus comprising a steering column, a rotatable steering shaft disposed within said steering column, a manually rotatable input member disposed at one end portion of said steering column

and connected with a first end portion of said steering shaft, said input member being rotatable to effect rotation of said steering shaft, drive means for turning at least one wheel of the vehicle in response to an input torque, said drive means being disposed forwardly and offset to one side of said steering shaft at a level lower than said input member, and torque transmitting means connected with a second end portion of said steering shaft for transmitting torque to said drive means along a path having both horizontally and vertically curved components in response to rotation of said steering shaft by said input member, said torque transmitting means comprising a series of adjacent torque transmitting bodies including a rotatable input body connected with said second end portion of said steering shaft, a rotatable output body connected with said drive means, a series of rotatable intermediate bodies disposed in a continuous row which extends between said input and output bodies along a nonlinear path having an arcuately curving portion of a length which is greater than the length of a plurality of said intermediate bodies, each one of said intermediate bodies having first surface means disposed in abutting engagement with a next preceding body for positively transmitting rotational motion between said preceding body and said one body without relative rotation between said



one body and said preceeding body upon rotation of said steering shaft and variations in the torque transmitted to said drive means and second surface means disposed in abutting engagement with a next succeeding body for positively transmitting rotational motion between said one body and said next succeeding body without relative rotation between said one body and said preceeding body upon rotation of said steering shaft and variations in the torque transmitted to said drive means, each of said intermediate bodies having an outer surface portion which has a smooth circular cross sectional configuration in a plane extending perpendicular to the central axis of said intermediate body, an elongated tubular casing having a longitudinally extending central passage with both horizontally and vertically curved components, said passage having a side surface with a generally circular cross sectional configuration in a plane extending perpendicular to the central axis of said casing, said side surface of said passage being disposed in circumscribing abutting engagement with the smooth circular outer surface portion of each of said intermediate bodies to at least partially support said intermediate bodies for rotation about their central axis, and means for holding said tubular casing against rotatioinal movement during rotation of said intermediate bodies.

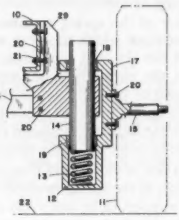
3,927,900

INDEPENDENT STEERING AXLE SUSPENSION

Thomas Harry Wischmeier, 4989 Countryside Road, Lyndhurst, Ohio 44124

Filed Aug. 5, 1974, Ser. No. 494,419
Int. Cl.[2] B60G *11/14*
U.S. Cl. 280—124 A **8 Claims**

1. An independent steering axle suspension adapted for attachment to a vehicle frame, comprising, in combination, a frame bracket attached to said vehicle frame; a pin rigidly attached to said frame bracket, said pin having upper and lower ends extending above and below said attachment point to said frame bracket; a support member disposed to rotate about and rectilinearly translate reciprically along the upper



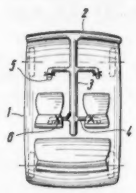
and lower ends of said pin; a stub axle rigidly affixed to said support member; and a load spring placed below the lower end of said pin between said pin and said support member, said load spring contacting said support member at a position below the lower end of said pin.

3,927,901

MOTOR VEHICLE EQUIPPED WITH INFLATABLE AIR BAGS FOR PASSENGER ACCIDENT PROTECTION

Per Olaf Weman, Haslah, Germany, assignor to Sigmatex, Basel, Switzerland

Filed Mar. 16, 1973, Ser. No. 342,124
Int. Cl.[2] B60R *19/10, 21/06*
U.S. Cl. 280—150 AB **10 Claims**



1. In a vehicle equipped with at least one inflatable air bag for protecting at least one passenger of the vehicle in case of an accident, wherein an inflation assembly for said bag comprises: a pressurized gas tank having a front portion and at least one branch portion in a continuous configuration extending from said front portion of said pressurized gas tank, said branch portion connecting said front portion to said at least one inflatable air bag, said front portion mounted in the front region of the vehicle and extending transversely of the vehicle longitudinal axis from one side to the opposite side of the vehicle; and at least one automatic valve, said one automatic valve connected between the pressurized gas tank and each associated inflatable air bag, said pressurized gas tank inflating said air bag upon impact during an accident, without the use of separate sensors, due to a sudden increase in pressure within the gas tank which causes said valve to open.

3,927,902

SAFETY BELT ARRANGEMENT FOR INDIVIDUALS

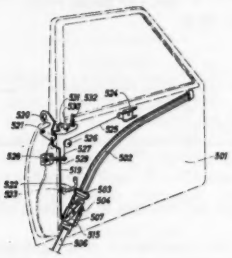
Oskar Lennart Lindblad, Hedasgatan 16, 440 20 Vargarda, Sweden

Division of Ser. No. 179,134, Sept. 9, 1971, Pat. No. 3,822,760. This application Apr. 5, 1974, Ser. No. 458,291

Claims priority, application Sweden, Sept. 9, 1970, 12225/70; Sept. 25, 1970, 13045/70; Nov. 2, 1970, 14714/70; Dec. 30, 1970, 17726/70; Dec. 31, 1970, 17858/70; Feb. 10, 1971, 1694/71

Int. Cl.[2] B60R *21/10*

U.S. Cl. 280—150 SB 5 Claims



1. An emergency release mechanism in a passive restraint safety belt system comprising a vehicle having at least one door, a guide extending in a longitudinal direction of said vehicle on the inside of said door, a slide moveably mounted on said guide, a coupling means being positioned on and near the rear lower edge of said door, locking means being connected to said vehicle and detachably connected to said coupling means for at time locking said door closed, releasing means detachably connecting said coupling means, slide and belt, a second releasing means detachably connecting said coupling means and said locking means and means capable of operating both said releasing means and being accessible from the outside of said door.

3,927,903

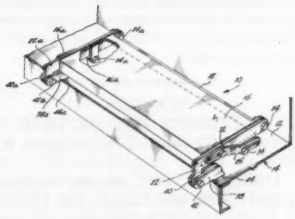
FOLDABLE STEP

George D. Jones, 19624 96th St. E., Sumner, Wash. 98390

Filed Aug. 28, 1974, Ser. No. 501,343

Int. Cl.[2] B60R *3/02*

U.S. Cl. 280—166 3 Claims



1. A foldable step unit for a truck having a bumper with a flat top surface comprising: a step; a pair of supports to span and to be pivotally connected near an end of each support to the step; means for linking between each of the supports and an adjacent side of the step for allowing the step to move from an in line position to a position normal with respect to the support, said means comprising an offset link having a pair of slots, and means for joining one of the slots to the support and for joining the other slot to the step; and a pair of bars each rigidly secured at one end thereof to the bumper and pivotally connected at the other end to a respective one of the supports to permit the supports with the step to move between a parallel folded position and a perpendicular use position with respect to the top surface of the bumper.

3,927,904

REAR DERAILLEUR FOR A BICYCLE

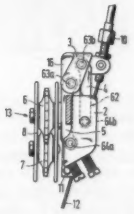
Eduard Bergles, Graz, Austria, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed Mar. 6, 1974, Ser. No. 448,619

Claims priority, application Germany, Mar. 23, 1973, 2314554

Int. Cl.[2] B62M *9/12*

U.S. Cl. 280—236 5 Claims



1. A vehicle comprising:

a. a frame;

b. a chain wheel mounted on said frame for rotation about a first axis;

c. a wheel shaft on said frame having a second axis spaced from and substantially parallel to said first axis;

d. a plurality of sprockets axially juxtaposed on said wheel shaft for rotation about said second axis;

e. a carrier member fastened to said frame in fixed spatial relationship to said second axis;

f. a guide wheel support;

g. first and second guide wheels mounted on said support in spaced relationship for rotation in a common plane fixed relative to said support;

h. linkage means movably connecting said support to said carrier member,

1. said first and second axes defining a plane intersecting the plane of rotation of said guide wheel along a line of intersection in each position of said support during said shifting of said support, the lines of intersection defined during said shifting converging in a direction from said second axis toward said first axis,

2. said linkage means including a four-member linkage constituted by said carrier member, said support, two guide links, and four pivots respectively connecting said guide links to said carrier member and to said support,

3. two pivots being associated with each member of said linkage,

4. each pivot having an axis,

5. the spacing of the two axes of the pivots associated with one member of said four-member linkage being different from the corresponding spacing of axes of pivots associated with the other three members of said linkage,

6. said pivots defining a planar quadrangle perpendicular to said pivot axes, said quadrangle being inclined relative to said plane defined by said first and second axes at an angle of 45° to 60°;

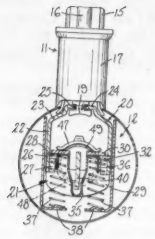
i. a drive chain trained over said chain wheel, one of said sprockets, and said guide wheels; and

j. manually operable means for shifting said support relative to said carrier member about said axes of said pivots.

3,927,905
RETRACTOR MECHANISM FOR LATCH BOLT

Lars Erickson, Clinton, Conn., assignor to Walter Kidde & Co., Inc., Belleville, N.J.

Filed July 19, 1974, Ser. No. 490,134
Int. Cl.² E05B 3/08; E05C 1/12
U.S. Cl. 292—169.22 3 Claims

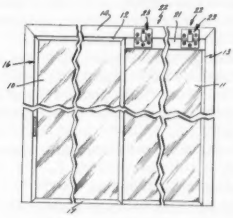


1. In a door lock having a latch bolt and inner and outer knob spindles provided with rollbacks, a two-part retractor comprising a forward part in engagement with the latch bolt and rear part loosely engaged with the forward part to be relatively movable between forward and rearward positions, the forward part being generally U-shaped and provided near its ends with rearwardly and forwardly facing spaced stop surfaces defining a lost motion gap said stop surfaces lying in planes perpendicular to the direction of retractor movement, the rear part of the retractor having portions adapted to bear alternatively against said stop surfaces, the size of the lost motion gap being a function of the spacing of said surfaces in said direction of retractor movement, and resilient means urging said rear part toward its forward position adjacent to both rollbacks and to said rearwardly facing stop surfaces, to open the said lost motion gap and enable the rear part to be moved rearward by either rollback without moving the forward part until said gap has been closed.

3,927,906
FLIP DOWN DOOR LOCK

Raymond J. Mieras, 1745 Ball, NE., Grand Rapids, Mich. 49505

Filed May 3, 1974, Ser. No. 466,521
Int. Cl.² E05C 17/04
U.S. Cl. 292—262 4 Claims

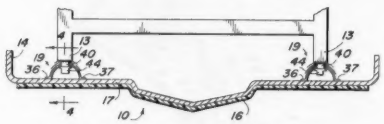


1. A locking means for preventing opening of a sliding closure wherein the sliding closure is slidably mounted in a frame having a header above the sliding closure and two jambs, said header having at least one sliding channel on the header along which the closure slides, said locking means comprising: an elongated rigid bar member; and mounting means for suspending said bar member from said header in a first closed position in abutting engagement between the edge of said closure and an adjacent jamb, said mounting means including a spring lock-hinge assembly for permitting swinging movement of said bar member from said first closed position to a second open position in disengagement from between the edge of said closure and said adjacent jamb to allow sliding of said closure in said frame and biasing said locking bar into said first closed position when therein and supporting said bar member over the closure when in said second position without additional support.

3,927,907
AUTOMOBILE BUMPER

Francis J. Bialek, 2536 N. Sawyer Ave., Chicago, Ill. 60647

Filed July 19, 1974, Ser. No. 490,092
Int. Cl.² B60R 19/02
U.S. Cl. 293—71 R 2 Claims



1. A bumper for attaching to the frame of moving vehicles comprising:

a bumper bar constructed of a rigid material extending across the width of the vehicle and including outer ends;

a first spring means and a second spring means, each of said spring means having a substantially "U" shape and including a hump portion between a pair of outer feet;

the pair of feet of said first spring means being attached to one of the ends of said bumper bar so that said first spring means extends inward therefrom, and the pair of feet of said second spring means being attached to the other end of said bumper bar so that said second spring means also extends inward therefrom;

said first and second spring means including a plurality of leaf springs laminated one on back of the other;

a first and second hollow member each including a front side and a rear side, each of said plurality of leaf springs passing through one of said hollow members so that said hump portion of the corresponding spring means is positioned in the hollow member, each of said hollow members being attached to the frame at the rear side thereof for securing said hump portion of the corresponding spring means to the frame;

a first cushioning means attached to the front side of the first hollow member and extending forward thereof spaced from the bumper bar and between the feet of said first spring means; and

a second cushioning means attached to the front side of the second hollow member and extending forward thereof spaced from the bumper bar and between the feet of said second spring means.

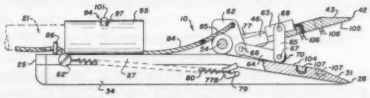
3,927,908
PULP SHEET GRIPPING TOOL

Harry Knelson, 1305 E. 6th Ave., Prince Rupert, B.C., Canada (V8J 1Y1)

Filed Jan. 22, 1975, Ser. No. 542,920
Claims priority, application Canada, Feb. 12, 1974, 192461
Int. Cl.² A47F 13/06
U.S. Cl. 294—19 R 10 Claims

1. A tool for gripping an edge of a remote piece of sheet material comprising a base plate, a handle secured to the base plate and extending rearwardly thereof, said base plate having a front portion enterable beneath an edge of the sheet material, a clamping jaw adjacent the front portion, hinge means securing the clamping jaw to the base plate for swinging movement between an open and a closed position with respect to the front portion, resilient means biasing the clamping jaw towards the closed position, linkage means including an upstanding lever pivotally connecting the clamping jaw to the

base plate and adapted to support said jaw in the open position against pressure applied by the resilient means, a trip member



secured at one end to the upstanding lever and extending rearwardly of the base plate substantially parallel to the handle.

3,927,909

APPARATUS FOR TRANSPORTING AND ADJUSTING ROTATIVE WORKPIECES

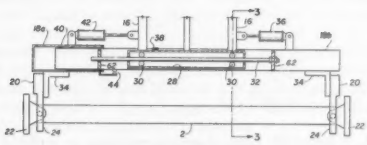
Heinrich Hack, Spachbruecken, Germany, assignor to Firma Carl Schenck AG, Darmstadt, Germany

Continuation-in-part of Ser. No. 335,079, Feb. 23, 1974, abandoned. This application Sept. 23, 1974, Ser. No. 508,345

Claims priority, application Germany, May 6, 1972, 2222336

Int. Cl.² B66C *1/42*

U.S. Cl. 294—81 R **6 Claims**



1. An apparatus for handling and precisely positioning long, flexible workpieces or workpieces with portions which are pivotable relative to each other so that their longitudinal alignment is necessary for said positioning, comprising a rigid frame structure, first and second horizontally extending cross support arms having a common longitudinal axis and arranged to telescope one within the other, means movably securing said support arms to said frame structure, said securing means including rigid guide means for said cross support arms to keep said arms in longitudinal alignment with each other, said cross support arms having free ends longitudinally aligned with each other, and gripping tongs operatively secured to said aligned free ends of the cross support arms, whereby a longitudinally effective aligning force may be applied to said workpiece by simultaneously gripping said workpiece at both of its ends, and then extending said support arms longitudinally outwardly.

3,927,910

RESILIENTLY LATERALLY SHIFTABLE AXLE MOUNTING BOGIE

Roger Fagel, Marcinelle, Belgium, assignor to Ateliers de Constructions Electriques de Charleroi (ACEC)

Filed June 7, 1974, Ser. No. 477,290

Claims priority, application Belgium, June 15, 1973, 5161

Int. Cl.² B60B *35/00, 37/10;* B61F *5/30, 5/46*

U.S. Cl. 295—36 R **6 Claims**

1. An axle arrangement for a high speed railroad bogie comprising:

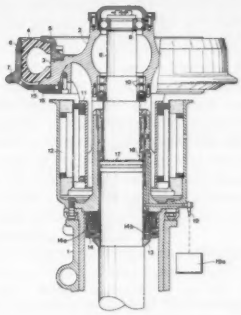
a. a flanged wheel carried by a longitudinally displaceable axle supporting a bogie frame, said axle being displaceable with respect to said bogie frame;

b. an abutment on said axle;

c. a shoulder fixed to said bogie frame;

d. resilient means coupled between said abutment and said shoulder;

e. said resilient means including a plurality of separate, contiguous, resilient rings on a common axis, one portion of said rings being arranged in a first pattern, another



portion of said rings being arranged in a second pattern, whereby said resilient means exerts a non-linear resistance to longitudinal displacements of said axle.

3,927,911

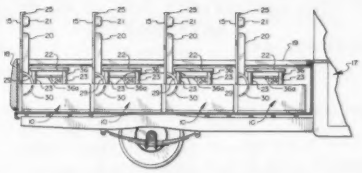
VERTICAL ADJUSTABLE COLLAPSIBLE SEAT

Gerald L. Rosquist, 71 S. 3rd East, Salina, Utah 84654

Filed Apr. 21, 1975, Ser. No. 570,269

Int. Cl.² B60P *3/38*

U.S. Cl. 297—15 **10 Claims**



1. In combination with a vehicle bed, a vertically adjustable, collapsible seat being totally enclosed in the collapsed position forming a flat surface area comprising:

a. an enclosure having a floor, a frontwall, a backwall, two endwalls and a cover pivotally attached to the backwall,

b. two pairs of vertical telescoping legs attached to the floor of the enclosure, the legs of each pair containing interconnected airtight cylinder compartments which are vertically expandable by pneumatic means and,

c. a seat fixedly attached at each end to the movable portions of the telescoping legs.

3,927,912

AUTOMATIC BRAKING SAFETY BELT REEL

Takezo Takada, deceased, late of Tokyo, Japan (by Juichiro Takada, legal authorized heir), assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 465,020

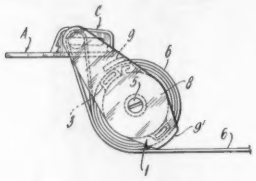
Claims priority, application Japan, May 2, 1973, 48-051206

Int. Cl.² A62B *35/00;* A44B *11/12*

U.S. Cl. 297—388 **6 Claims**

1. A vehicle safety belt device comprising a frame member including a cross piece and a pair of transversely spaced parallel side legs extending from said cross piece, a coupling member connected to and projecting forwardly from said frame member, a spool extending between and rotatably supported by said frame side legs, a safety belt having a first end connected to said spool and an opposite end extending to a vehicle anchor point, a spring resiliently biasing said spool to wind up said belt in a coil thereon in a belt retracted condition and

a brake bar extending between and rockably supported by the forward ends of said frame side legs, said frame cross piece and side legs being of widths less than the dianfeter of said coil in said belt retracted condition, said coupling member including a rear cross web having a transversely extending opening formed therein, and a pair of upstanding side walls projecting from said cross web and provided with longitudinal slots slideably engaging the ends of said brake bar, said coupling member being swingable with said brake bar, said belt extending from said spool forwardly through said cross web opening about said brake bar and back through said opening, whereby said coupling member is swingable between a longitudinally extending belt braking position and an angularly extending belt releasing position.



3,927,913

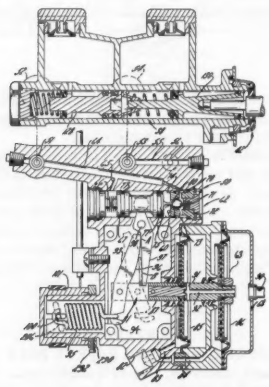
SKID CONTROL SYSTEM COMPONENTS

Edward A. Rockwell, 167 Ashdale Place, Los Angeles, Calif. 90049

Division of Ser. No. 168,683, Aug. 3, 1971, Pat. No. 3,829,171. This application Oct. 1, 1973, Ser. No. 402,143

Int. Cl.² B60T *8/12*

U.S. Cl. 303—6 C **15 Claims**



1. In a hydraulic brake system for a vehicle having front and rear wheel brakes, the combination comprising:

a power booster for assisting manual effort in operating said front and rear wheel brakes;

a variable proportioning device in said hydraulic brake system for varying the ratio of front to rear braking forces as a varying, non-linear function of tire-road coefficient of friction, which function approximately matches the non-linear function as defined by the Holland equation for S_f/S_r, the device being directly controlled responsive to variations of internal pressures in said power booster; and deceleration responsive means for detecting vehicle deceleration and for controlling said power booster in response to changes in deceleration reflecting impending wheel lockup, and to thereafter reestablish rolling contact of the wheel with the road, by modulating the braking forces at both front and rear wheels about their maximum to maintain maximum vehicle deceleration without wheel lockup.

3,927,914

HYDRAULIC ANTI-SKID CONTROL ARRANGEMENT INCLUDING A PLURALITY OF THROTTLES FOR SYNCHRONOUS AND ASYNCHRONOUS CONTROL OF THE WHEELS OF ONE AXLE OF A VEHICLE

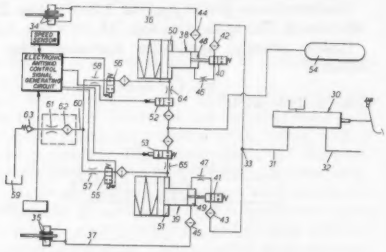
Werner Fink, and Dieter Kircher, both of Frankfurt am Main, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Division of Ser. No. 290,293, Sept. 22, 1972, Pat. No. 3,819,236. This application Oct. 17, 1973, Ser. No. 407,123

Claims priority, application Germany, Nov. 4, 1971, 2154806

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 F **3 Claims**



1. A hydraulic control arrangement for an antiskid control system comprising:

a pair of wheel brake cylinders, each of said brake cylinders being associated with a different one of a pair of wheels of a single axle of a motor vehicle;

a master cylinder;

a reservoir;

a pressure medium accumulator;

a first hydraulically controlled plunger unit including a first chamber, a second chamber and a first plunger sealably separating said first and second chamber and movable in said first and second chambers;

a first normally open separating valve mechanically connected to said first plunger and hydraulically connected to said master cylinder;

a first throttle hydraulically connected in series with said first separating valve and said first chamber, said first chamber being hydraulically connected to one of said pair of brake cylinders;

a second hydraulically controlled plunger unit including a third chamber, a fourth chamber and a second plunger sealably separating said third and fourth chambers and movable in said third and fourth chambers;

a second normally open separating valve mechanically connected to said second plunger and hydraulically connected to said master cylinder;

a second throttle hydraulically connected in series with said second separating valve and said third chamber, said third chamber being hydraulically connected to the other of said pair of brake cylinders;

a first normally closed input valve hydraulically connected to said accumulator responsive to a first control signal indicating the state of motion of an associated one of said pair of wheels;

a third throttle hydraulically connected in series with said first input valve and said second chamber;

a first normally open output valve hydraulically connected to said second chamber responsive to said first control signal;

a fourth throttle hydraulically connected in series with said first output valve;

a second normally closed input valve hydraulically connected to said accumulator responsive to a second control signal indicating the state of motion of an associated one of said pair of wheels;

a fifth throttle hydraulically connected in series with said second input valve and said fourth chamber;

a second normally open output valve hydraulically connected to said fourth chamber responsive to said second control signal;

a sixth throttle hydraulically connected in series with said second output valve;

an emergency throttle hydraulically connected in common to said fourth and sixth throttles; and

a non-return valve hydraulically connected in series with said emergency throttle and said reservoir;

said first input valve and said first output valve responding to an incipient skid condition of said first control signal to actuate said first plunger by pressure medium from said accumulator operating in said second chamber, said first plunger in turn actuating said first separating valve to block pressure medium flow from said master cylinder to said one of said pair of brake cylinders and cause a volume expansion for said one of said brake cylinders in said first chamber; and

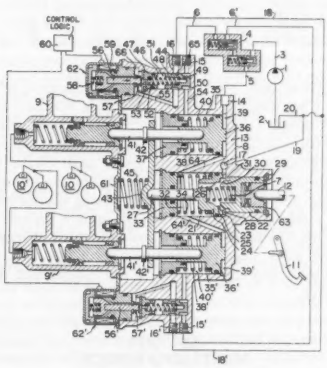
said second input valve and said second output valve responding to an incipient skid condition of said second control signal to actuate said second plunger by pressure medium from said accumulator operating in said fourth chamber, said second plunger in turn actuating said second separating valve to block pressure medium from said master cylinder to said other of said pair of brake cylinders and cause a volume expansion for said other of said brake cylinders in said third chamber.

3,927,915

VEHICLE ANTI-LOCK BRAKE SYSTEM WITH BOOSTER DEVICE

Yoshiharu Adachi, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 8, 1974, Ser. No. 495,809
Claims priority, application Japan, Aug. 18, 1973, 48-92711
Int. Cl.² B60T 8/06
U.S. Cl. 303—21 F **15 Claims**



1. A vehicle brake system comprising:

a. master cylinder means for actuating at least one wheel brake;

b. means for multiplying the braking power applied to said master cylinder means including a power piston connected to said master cylinder means with a pressure chamber defined at one side of said power piston and a reaction chamber defined at the other side of said power piston;

c. means for introducing pressure into said pressure chamber to move said power piston in a brake-applying direction, said introducing means including a first fluid circuit;

d. means for controlling the introduction of pressure into said pressure chamber, said means including (i) a pressure flow return line, (ii) a piston having a first chamber defined at one side of the piston and connected to said pressure chamber and said first circuit, and a second chamber defined at the other side of the piston and connected to said pressure fluid return line, (iii) a passage formed in said piston connecting said first and second chambers with each other, and (iv) a manually-operated valve member for controlling the flow of fluid through the passage of said piston to thereby regulate the pressure in said first chamber;

e. means for introducing pressure into said reaction chamber to effect a release of said brake when wheel lock is detected, said means including a second fluid circuit independent of said first circuit;

f. means for controlling the pressure introduced into said reaction chamber including (i) a pressure fluid return line, (ii) a fluid flow control valve defining a chamber connecting the second fluid circuit to said pressure fluid return line and to said reaction chamber, and (iii) means for controlling the position of said fluid flow control valve so as to control the flow from said chamber to said return line;

g. electrical means for actuating said control valve position controlling means in response to the locking condition of the wheel brake; and

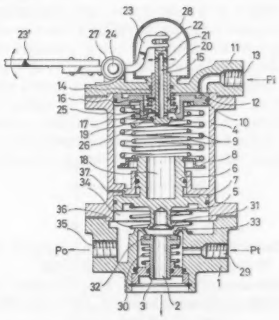
h. a fluid flow divider valve having an input from a pressurized fluid source and at least two outputs connected respectively with said first and second fluid circuits.

3,927,916

COMBINED LOAD-SENSING PROPORTION AND RELAY VALVE

Kaosuke Masuda, Higashimatsuyama, Japan, assignor to Jidosha Kiki Co., Ltd, Tokyo, Japan

Filed May 31, 1974, Ser. No. 475,301
Claims priority, application Japan, June 20, 1973, 48-69566
Int. Cl.² B60T 8/18
U.S. Cl. 303—22 R **4 Claims**



1. A combined load-sensing proportion and relay valve comprising a valve disk having a central axis with an exhaust passage on the central axis and held in a normally closed-valve condition, and a control piston assembly for adjustably moving the valve disk to open the valve disk, characterized in that the control piston assembly consists of three pressure-sensitive pistons, the third piston being formed in one piece with the first piston, said first piston having a downward projection extended from its underside, with the lower end of the projection serving as a valve seat opposite to and engageable with the valve disk, a load spring is disposed between the second

and third pressure-sensitive pistons, a regulated-pressure controller consisting of a regulated-pressure exhaust valve held in a normally-open condition and an indicated-pressure feed valve held in a normally closed condition is located with a part of the second pressure-sensitive piston serving as its valve seat, an indicated-pressure chamber is formed above the second piston, and a regulated-pressure chamber is formed between the underside of the second piston and the upper side of the third piston, said regulated-pressure exhaust valve that governs the opening and closing of the indicated-pressure feed valve and the exhausting of the regulated-pressure being located in such a manner that its position is adjustable according to the payload of the vehicle equipped with the relay valve.

3,927,917
OPERATOR'S BRAKE VALVE FOR A RAILWAY VEHICLE AIR BRAKING SYSTEM

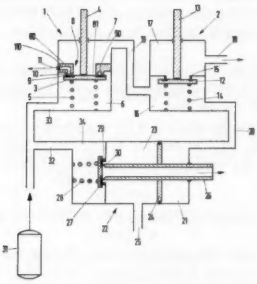
Erich Falke, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Dec. 18, 1974, Ser. No. 533,835

Claims priority, application Germany, Dec. 20, 1973, 2363554

Int. Cl.² B60T *15/12*, *15/06*

U.S. Cl. 303—68 **3 Claims**



1. A selectively operable valve device for an operator's brake valve for an indirect air braking system on a railway vehicle for the direct or indirect control of the pressure in an air line by means of a relay valve, and comprising a brake valve and a release valve each having a valve member urged in the closing direction and each being manually displaceable in the open direction, means for defining a valve seat engageable by said release valve member when closed and comprising a pair of annular concentric seats to define an annular space therebetween, and means for defining a passage from said annular space to the atmosphere whereby any air leakage past said release valve member will escape to the atmosphere.

3,927,918
SLIDE ASSEMBLY

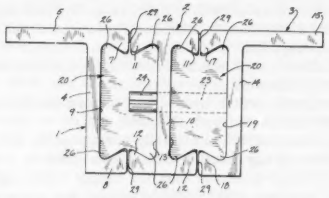
Edward J. Dobbratz, Watertown, Wis., assignor to Janet E. Dobbratz, Watertown, Wis., a part interest

Continuation-in-part of Ser. No. 300,773, Oct. 25, 1972, abandoned. This application Sept. 17, 1973, Ser. No. 397,784

Int. Cl.² F16C *17/00*

U.S. Cl. 308—3.6 **15 Claims**

1. A slide assembly, comprising a first slide member, a second slide member disposed to slide relative to said first slide member between a retracted and an extended position, each slide member including a web and a pair of flanges extending outwardly from the ends of the web, the flanges of said first slide member being in proximate abutting relation to corresponding flanges of the second slide member, the flanges of each slide member in combination with the web defining a female dovetail groove extending longitudinally of the slide member, a first block secured with the groove of the first slide member and freely slidable within the groove of the second slide member, a second block secured within the groove of the second slide member and freely slidable within the groove of the first slide member, opposite sides of each block having opposed male dovetail portions mating with the female dovetail grooves of said slide members, each male dovetail portion including an inclined surface that intersects the inclined surface of a second male dovetail portion at a central groove, and a fin extending outwardly from each groove with each fin having a pair of generally flat opposed surfaces with one of said opposed surfaces being disposed flatwise against the flange of said first slide member and the other of said opposed surfaces being disposed flatwise against the flange of said second slide member, to prevent contact between said flanges.



3,927,919
SUPPORT AND GUIDE CAGE

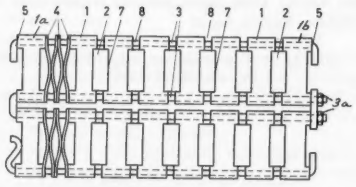
Paul Bunzli, Bevaix, Switzerland, assignor to Hydrel A.G., Romanshorn, Switzerland

Filed Aug. 22, 1974, Ser. No. 499,846

Claims priority, application Switzerland, Aug. 25, 1973, 12348/73

Int. Cl.² F16C *29/04*

U.S. Cl. 308—6 R **7 Claims**



1. In a roller body guide cage for a roller bearing of a longitudinally displaceable carriage, such as a machine tool carriage, including a plurality of uniformly-shaped guide cage elements for retaining roller bodies therebetween; at least two parallel elongate elements, said guide cage elements being serially mounted on said elongate elements, the improvement comprising: said guide cage elements being supported in said elongate elements for longitudinal movement therealong; and at least one prestressed element being located at least at one end of said guide cage for exerting a force against said guide cage elements and roller bodies in the longitudinal direction of said cage.

3,927,920
MOVEMENT DEVICE

Frederick S. Falks, Comstock Park, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Division of Ser. No. 310,411, Nov. 29, 1972, Pat. No. 3,883,192. This application Feb. 6, 1974, Ser. No. 440,030

Int. Cl.² F16C *17/00*

U.S. Cl. 308—36 **7 Claims**

1. A bearing to be positioned between a shaft or the like and a bearing sleeve or the like for facilitating movement therebe-

tween, said bearing comprising: a rigid generally rod-like support of a closed circuit configuration; a flexible sleeve slidably mounted on said support and entirely enclosing said support, said flexible sleeve also defining a closed circuit configuration; said shaft frictionally engaging said flexible

sleeve on the inside of said closed circuit; said bearing sleeve frictionally engaging said flexible sleeve on the outside of said closed circuit whereby when one of said shaft or bearing sleeve is rotated, said flexible sleeve slides on said rigid support and allows said shaft and said bearing sleeve to rotate relative to one another.

3,927,921

LUBRICATED AXIAL THRUST BEARING

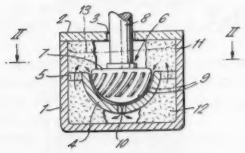
Ronald William Woolley, Poole, England, assignor to British Gas Corporation, London, England

Filed May 31, 1974, Ser. No. 475,310

Claims priority, application United Kingdom, June 4, 1973, 26472/73

Int. Cl.² F16C *1/24, 17/08, 23/04, 35/10*

U.S. Cl. 308—134.1 **8 Claims**



1. A recirculatory lubricated bearing comprising a rotary member which includes a housing with an opening at one end and a bearing cup fixed in the housing with its mouth directed toward the said opening and with a lubricant space in the housing surrounding the cup and extending on both sides of a plane defined by the rim of the bearing cup, said cup having an aperture centrally located in the cup bottom, a stationary member having a bearing part fitting in the bearing cup for rotatably supporting the rotary member and a part extending from the bearing part and projecting from the housing through its opening, means for preventing the discharge of lubricant from the opening of the housing as the housing rotates, the rotary and stationary bearing members being axially biased toward positions of mutual engagement of their bearing surfaces defined by the interior surface of said bearing cup and the external surface of said stationary bearing part, at least one of the bearing surfaces being provided with grooves for producing a viscous pumping action on the lubricant in use of the bearing, the lubricant space within the housing being filled with lubricant to a level beyond the mouth of the cup such that during rotation of the housing the lubricant assumes a vortex within the housing causing it to adopt a tube-like shape as it is forced centrifugally outwardly against the peripheral wall of the housing, but such that it can be drawn via the viscous pumping action of the pumping grooves between the bearing surface of the cup and the bearing surface of the stationary bearing member and then discharged through the central aperture in the cup whence it is caused to recirculate into the mass of lubricant in the housing.

3,927,922

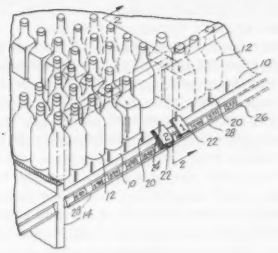
INVENTORY DEVICE FOR PACKAGED ITEMS

Askew Warren Gatewood, Jr., 1804 Edmondson Ave., Baltimore, Md. 21223

Filed Dec. 28, 1973, Ser. No. 429,675

Int. Cl.² A47B *81/00*; B42F *21/00*

U.S. Cl. 312—234 **6 Claims**



1. An inventory device for packaged items to be sold, including heavy and bulky items, comprising in combination, a generally horizontal, flat, shelf member forming a supporting seat for a designated number of packaged items to be held in a row on said shelf member from front to rear thereof, and an upstanding, straight pin secured to the front of said shelf substantially in alignment with the packaged items when seated on the shelf member, said pin being adapted to impale and hold a sales slip for each packaged item when it is sold and removed from the row on the shelf member, whereby a count of the sales slips on the pin and the remaining items in the row on the shelf member should total said designated number and yield a quick determination of theft when the total is less than the designated number.

3,927,923

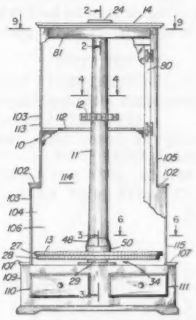
GUN RACK

Ray D. Kimmel, R.D. No. 1, Box 257, Ashland, Pa. 17921

Filed July 28, 1972, Ser. No. 276,249

Int. Cl.² A47B *49/00*; A47F *7/00*

U.S. Cl. 312—252 **10 Claims**



1. In a gun rack comprising a cabinet having a floor and a top wall and a rotatable post therebetween, bearing means at the upper and lower end portions of the post to facilitate rotation thereof, an upper rotor on the post for supporting gun barrels, a lower rotor on the post for supporting gun butts, drive means for rotating the post, and power means beneath said floor for operating said drive means, the improvement comprising

a reduced lower end portion on the post which extends through and is engaged by the lower rotor, said lower

bearing means supporting said reduced lower post end portion and being supported by a stationary bearing support means which in turn rests on and is attached to said floor, said lower bearing means comprising a tapered roller bearing having inner and outer races, said outer race being engaged by said reduced lower post end portion and being rotatable therewith, said stationary bearing support means having a portion which engages said inner race to hold the latter stationary, and said post having a portion of increased diameter above the lower rotor to facilitate securing the latter to the post,

said upper rotor having a plurality of recesses in the peripheral edge thereof each of which receives and supports a gun barrel adjacent the muzzle thereof, a barrel-supporting recessed removable insert in the peripheral edge of the upper rotor between each pair of adjacent peripheral recesses, each of said peripheral and insert recesses having a cushion liner for soft engagement with a gun barrel, said lower rotor having a plurality of gun butt-receiving recesses, a butt-supporting piece in the floor of each said gun butt receiving recesses, each said piece being surrounded by the lateral walls of said recess, said piece and said walls helping to stabilize the position of a gun on said rack, and said lower rotor having between each pair of adjacent gun butt-receiving recesses an added removable gun butt-supporting piece having butt-retaining walls,

said inserts of the upper rotor and said added pieces of the lower rotor serving to increase the gun holding capacity of the rack,

said drive means for rotating the post extending through said floor and into the post to operatively engage the latter,

said cabinet having a transparent door through which guns on the rack may be examined, a headpiece over the door, a pair of spaced switches on the back side of the headpiece one of which energizes a lamp-containing circuit and the other of which energizes a circuit containing said power means, each switch having a switch-operating shank extending through the headpiece and terminating on the front side thereof in a button end, a pivoted manually movable actuator on the front side of the headpiece engageable with one button or the other and operative to actuate one switch or the other, and said switch which energizes the power means-containing circuit having spring means associated with the shank thereof so that the latter moves against the action of said spring means, whereby said actuator must be held in button end-engaging position in order to rotate the post.

3,927,924
PANEL JOINING AND WORK SURFACE SUPPORT APPARATUS

James O. Kelley, Spring Lake, Mich., assignor to Herman Miller Inc., Zeeland, Mich.

Filed May 28, 1974, Ser. No. 473,820
Int. Cl.[2] A47F *09/00*; A47B *47/00*
U.S. Cl. 312—263 **34 Claims**

1. In a space-dividing furniture system having a first component and a second component adapted to be affixed to said first component, each of said components including end edges, a top edge, and side surfaces extending between said end edges, and means for locking said components together at said end edges to form a space-dividing arrangement, said system also including a work surface panel; the improvement comprising:

an integral bracket including joining means integral therewith for engaging said locking means and securing said components together and support means integral with said joining means for engaging the underside of said work surface panel and supporting said work surface panel along, over at least a portion of the top edge of, and outwardly of at least one of said side surfaces of at least one of said components;

said joining means engaging said locking means intermediate said end edges thereby securing said components together only from between said end edges;

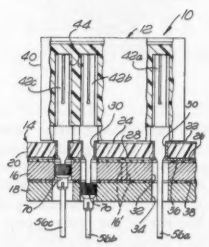
said support means including at least one outward extension adapted to underly, contact, and support said work surface panel at points spaced outwardly from said top edge and outwardly of said one side surface of said one component to stabilize said work surface panel in a predetermined plane; and

attaching means on said bracket for affixing said bracket to said work surface panel to stabilize said work surface panel at a predetermined position within said predetermined plane, said bracket together with said attaching means preventing movement of said work surface panel in any two opposite directions.

3,927,925
CONNECTOR ASSEMBLY

Leslie M. Borsuk, 11622 Kensington Road, Los Alamitos, Calif. 91316

Filed Nov. 19, 1973, Ser. No. 417,295
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 P **18 Claims**



1. A connector assembly comprising:

upper and lower superposed metallic layers separated by an insulation layer and adapted to be maintained at different potentials, at least said lower layer being a self-supporting plate;

a printed circuit board superposed over said metallic layers;

a plurality of holes in said printed circuit board;

a plurality of openings in said layers aligned with said holes;

a plurality of contacts mounted in said aligned holes and openings, each said contact being press-fit into its corresponding hole and having a lower portion extending into its corresponding openings;

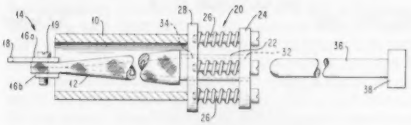
a metallic bushing on said lower portion of one of said contacts electrically and mechanically connecting said one contact to said lower layer; and

another of said contacts being a signal contact, at least the hole in which said signal contact is press-fit being a plated-through hole.

3,927,926
SPIRAL BRAID CONNECTOR

Jack B. Powell, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 26, 1974, Ser. No. 483,279
Int. Cl.² H01R *13/62*
U.S. Cl. 339—74 R **2 Claims**



1. A quick connect-disconnect power connector comprising;

an elongated housing having a first and second end;

a spiral braid having a tubular form providing an opening therethrough at least at said second end of said housing; means for connecting a first end of said spiral braid to said first end of said housing;

means for providing a variable tension connection between the second end of said spiral braid and said housing which includes a pressure plate movably attached to the second end of said elongated housing by rods which extend from the second end of said elongated housing through openings in said pressure plate to provide sliding movement of said pressure plate towards and away from said housing; a plurality of springs, one attached to each of said rods, to provide the tension between said pressure plate and said second end of said housing and said second end of said spiral braid;

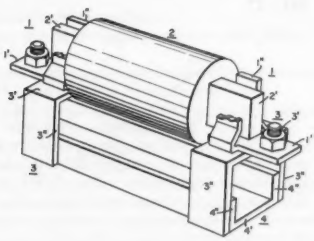
a connector pin adapted to fit tightly into said opening in said spiral braid at said second end of said braid so that the insertion force varies the tension on said variable tension means thereby relieving the tension on said spiral braid and causing the tubular form spiral braid length to diminish and the diameter thereof to enlarge for easier insertion of said connector pin;

said spiral braid increasing in length and decreasing its tubular form diameter when the spring tension is reapplied between said spiral braid and housing thereby frictionally grasping said connector pin preventing its removal and providing a multi-contact electrical connection between said spiral braid and connector pin.

3,927,927
COMPOSITE FUSE HOLDERS

Erwin Salzer, Waban, Mass., and Frederick J. Kozacka, South Hampton, N.H., assignors to The Chase-Shawmut Company, Newburyport, Mass.

Filed Nov. 1, 1974, Ser. No. 519,918
Int. Cl.² H01R *9/12*
U.S. Cl. 339—125 R **12 Claims**



1. A fuse holder for electric fuses comprising

a. a pair of fuse-receiving contacts;

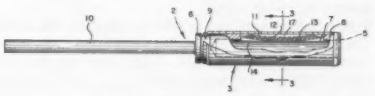
b. a pair of aligned spaced supports of synthetic resin for said pair of contacts each having a web portion supporting one of said pair of contacts, and each having lateral flange portions projecting at substantially right angles from said web portion thereof: and

c. a tie member of a synthetic resin having surfaces telescopically mating with, and adhesively affixed to, said lateral flange portions of said pair of supports.

3,927,928
MULTIPLE SPRING SOCKET FOR PIN CONNECTOR

Robert Algerd Pustell, Melrose, and Thomas Parker Haselton, Lynn, both of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed June 5, 1974, Ser. No. 476,524
Int. Cl.² H01R *13/12*
U.S. Cl. 339—256 R **2 Claims**



1. In a spring loaded pin and socket connector, the combination comprising:

a. a socket contact member including,

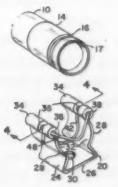
1. a socket member having a bore for receiving a pin,
2. a retaining slot in said socket member communicating with said bore for retaining a pin retaining means,
3. a spring assembly of tapered construction in the radial direction including a plurality of resilient leaf springs positioned together in said retaining slot to provide a spring loaded contact, each of said leaf springs being of a different width so that said leaf springs when nested together form said tapered spring assembly,
4. a retaining sleeve positioned on the socket to cover the retaining slot to limit deflection of said leaf springs to prevent deformation of said springs.

b. a pin member including a cylindrical pin portion adapted to engage the said spring assembly in said bore to provide firm mechanical and electrical contact between said pin and socket.

3,927,929
REJECTION-TYPE CARTRIDGE FUSE CLIP

Jordan F. Puetz, Milwaukee, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 3, 1974, Ser. No. 511,889
Int. Cl.² H01H *85/20, 85/24*
U.S. Cl. 339—258 F **7 Claims**



1. A fuse clip for releasably engaging a cartridge fuse of the type having cylindrical ferrules at the opposite ends thereof with one of the ferrules having an annular groove comprising: a pair of spaced generally parallel flexible clamping arms providing a pair of spaced confronting curved contact surfaces for engaging opposite sides of the grooved ferrule and a wire-like member suspended between the arms, said member hav-

ing a curved portion positioned in the space between the pair of contact surfaces to be received in the groove when a grooved ferrule is positioned between the curved contact surfaces and providing an obstruction for preventing the insertion of any ferrule on a fuse not provided with an annular groove.

3,927,930

LIGHT POLARIZATION EMPLOYING MAGNETICALLY ORIENTED FERRITE SUSPENSIONS

Paul Goldberg, West Newton, and Pieter J. van Heerden, Concord, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 270,526, July 10, 1972, abandoned, which is a continuation-in-part of Ser. No. 86,997, Nov. 4, 1970, abandoned. This application May 13, 1974, Ser. No. 469,373

Int. Cl.² G02F *1/09*

U.S. Cl. 350—151 **9 Claims**

1. Light polarization apparatus comprising:

a source of visible light;

a light polarizer exposed to said visible light and comprising finely divided ferrite particles suspended in an inert light-transmitting medium on a transparent support, said ferrite particles being magnetically oriented in said medium into line-shaped patterns which polarize said visible light transmitted through said suspension; and

means for detecting said transmitted polarized light.

6. A method of light polarization which comprises:

exposing to a source of visible light, a suspension of finely divided ferrite particles in an inert liquid medium on a transparent support;

subjecting said suspension to a magnetic field to orient said particles in said medium into line-shaped patterns which polarize said visible light transmitted through said suspension to form a light polarizer; and

detecting said transmitted polarized light by observing said light through conventional polarized light detection means.

3,927,931

VARIFOCAL OBJECTIVE

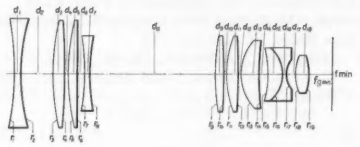
Trude Muszumanski, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Dec. 28, 1973, Ser. No. 429,696

Claims priority, application Austria, Jan. 3, 1973, 45/73

Int. Cl.² G02B *15/00*

U.S. Cl. 350—184 **5 Claims**



1. A varifocal objective consisting of a fixed positive front component, an axially shiftable negative intermediate component and a fixed positive rear component; said front component consisting of a biconcave first lens, a biconvex second lens, and a nearly planoconvex third lens closely spaced from said second lens, said first lens being separated from said second lens by an air space close to half the axial length of said front component; said intermediate component being a single negative lens; said rear component consisting, from front to rear, of two biconvex positive lens members, a meniscus-shaped positive lens member, a biconcave lens member and another biconvex lens member; the individual focal lengths of said front component, said intermediate component and said rear component being approximately related in the ratio +5.5 : −2.5 : +1, the relative positioning of said components being such as to provide an image diagonal which is shorter than the separation of said first and second lenses.

3,927,932

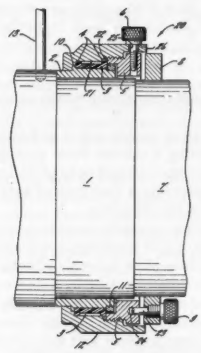
ZOOM LENS CONTROL DEVICE

Alfred S. Chrosziel, Orleanstrasse 5a, 8000 Munich 80, Germany

Filed Oct. 9, 1974, Ser. No. 513,402

Int. Cl.² G02B *15/14*

U.S. Cl. 350—187 **5 Claims**



1. For use with a zoom lens having a fixed element and a zoom cylinder rotatable relative to the fixed element for varying the effective focal length of the lens, a device comprising, in combination, a ring mounted for relative rotation on said zoom cylinder and defining an inner cylindrical surface, an annular element of deformable material having a low coefficient of friction fixed to said zoom cylinder and formed with a tongue in engagement with said cylinder surface, a pressure member threaded into said ring and having a surface bearing against said element, and means for floatingly locking said member to said fixed element to prevent relative rotation, whereby rotation of said ring, through said threaded pressure member, selectively deforms said element to vary the pressure of said tongue on said surface and thus establish a controllable resistance to relative rotation of the zoom cylinder and the fixed element.

3,927,933

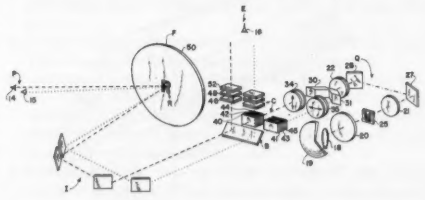
APPARATUS FOR OPTHALMOLOGICAL PRESCRIPTION READOUT

William E. Humphrey, Oakland, Calif., assignor to Humphrey Instruments, Inc., Berkeley, Calif.

Continuation of Ser. No. 385,784, Aug. 6, 1973, abandoned. This application June 26, 1974, Ser. No. 483,171

Int. Cl.² A61B *3/10;* **G02B** *13/08*

U.S. Cl. 351—17 **15 Claims**



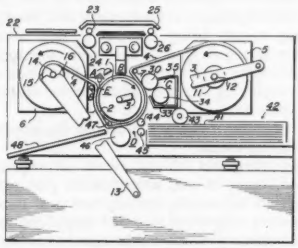
1. An eye testing device providing for digital readout of astigmatic lens power and angle comprising: a patient viewing

station; an image to be viewed from a preselected location; first means for varying astigmatic lens power to said image, said first means varying said astigmatic power along first and second substantially perpendicular axes normal to a light path from said image; second means for varying the astigmatic lens power to said image, said second means for varying the astigmatic lens power occuring along third and fourth axes normal to the light path from said image, said third and fourth axes being positioned relative to said first and second axes so that first imaginary planes taken through said first and second axes including said light path do not coincide with second imaginary planes taken through said third and fourth axes including said light path; first signal generation means coupled to said first astigmatic lens means for generating a signal proportionate to the astigmatic lens power generated at said first astigmatic lens power means; second signal generation means coupled to said second astigmatic lens means for generating a signal proportionate to the astigmatic lens power generated at said second astigmatic lens means; means for emulating a Cartesian coordinate plot having first and second inputs connected to said first and second signal generation means emulating first and second axes of said Cartesian coordinate plot; output means for emulating a polar coordinate plot operatively connected to said means for emulating a Cartesian coordinate plot, said output means including a first output for resolving the power of the resultant polar coordinate of said polar coordinate plot and second output means for determining the resultant half angle of the resultant polar coordinate plot of said polar coordinate plot.

3,927,934
ELECTROSTATOGRAPHIC REPRODUCTION MACHINES

John Hayward Cook, Fawbridgeworth, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1974, Ser. No. 450,267
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **19 Claims**



1. An electrostatographic reproduction machine comprising:

a photoconductive member;

developer means arranged relative to said photoconductive member;

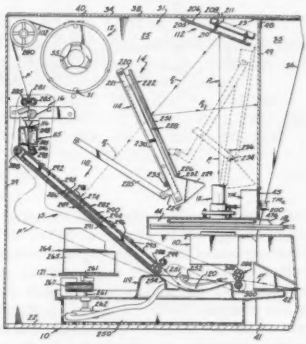
web means interposed between said photoconductive member and said developer means; and,

a sectional cassette having first and second portions movable relative to each other for supporting said web therein, said web being feedable from one of said cassette portions to the other of said cassette portions between said photoconductive member and said developer means, said photoconductive member being movable from an operative position to an inoperative position in which said web is insertable into said machine, said web being interposed between said photoconductive member and said developer means when said photoconductive member is returned to said operative position.

3,927,935
DRIVE SYSTEM WITH MECHANICAL TIME DELAY

Lawrence M. Freeman, 599 Ansley Court, NE., Atlanta, Ga. 30324, and Francis T. Arnold, 2379 Tristan Circle, NE., Atlanta, Ga. 30345

Division of Ser. No. 304,519, Nov. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,114, May 24, 1971, Pat. No. 3,730,622. This application June 17, 1974, Ser. No. 479,887
Int. Cl.² G03G *15/00*
U.S. Cl. 355—14 **4 Claims**



1. In an apparatus for electrostatically copying images from an original document onto copy paper including a supply of copy paper, an image forming means for reproducing the image on the original document medium onto the copy paper, and conveying means for selectively transporting said copy paper from said supply of copy paper through the image forming means; the improvement comprising:

a flexible endless transfer member movable along a prescribed endless path;

drive means for moving said transfer member along said path;

driven member means positioned adjacent said prescribed path and operatively connected to said conveying means for driving same as said driven member is driven; and

a flexible engaging member carried by said endless transfer member, said engaging member having a predetermined length shorter than said endless transfer member, defining a gap between opposite ends thereof, and located at a predetermined position on said endless transfer member so that said engaging member drivingly engages said driven member to drive said conveying means as said endless transfer member moves said engaging member thereby and to not drive said conveying means as said gap moves thereby.

3,927,936
BLADE TYPE CLEANING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE OF THE IMAGE TRANSFER TYPE

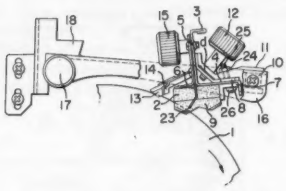
Shigehiro Komori; Hisashi Sakamaki, both of Yokohama; Hiroyuki Hattori, Mitaka; Toshihide Iida, Tokyo; Koichi Miyamoto, Tokyo, and Kazumi Umezawa, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed July 2, 1973, Ser. No. 375,463
Claims priority, application Japan, July 18, 1972, 47-71860
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **10 Claims**

1. A blade type cleaning device in an electrophotographic copying machine of the image transfer type comprising:

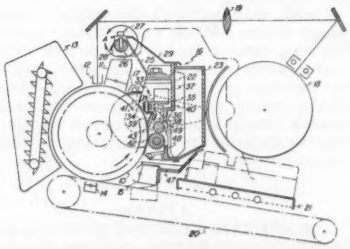
a blade member having an end edge thereof making pressure-contact with the surface of a rotatable photosensitive medium to clean said surface;

blade mounting means;
support means for supporting said blade mounting means on the body of said copying machine;
said blade member being of high polymer material and having said pressure contact edge formed into substantially a right angle and contacting the photosensitive medium at a position thereof lower than the highest portion of the photosensitive member by an angle within the range of 0° to 40° in the direction of movement of said



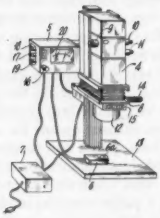
photosensitive medium, the angle of contact of said blade member being within a range of 25° to 40° with respect to that portion of the tangential plane containing a line of contact between the end edge and the surface of the photosensitive member, which extends downstream of the line of contact with respect to the direction of movement of the photosensitive medium, and the surface of the photosensitive medium and an end surface of said blade member forming a V-shaped groove.

3,927,937
CLEANING ASSEMBLY FOR AN ELECTROSTATOGRAPHIC DEVICE
Cornelis Jacobus de Keyzer, Venray, Netherlands, assignor to Rank Xerox Ltd., London, England
Filed Nov. 1, 1973, Ser. No. 411,951
Claims priority, application Netherlands, Nov. 10, 1972, 7215210
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **12 Claims**



1. An apparatus for collecting particles removed from a movable image bearing surface of an electrostatographic apparatus comprising;
means for removing said particles from said movable image bearing surface;
a chamber for receiving said particles;
a first roller and a second roller mounted for rotation in rolling engagement with one another, with a nip being formed between said rollers, said rollers being positioned to collect said particles removed by said removing means and to transport said particles through said nip into said chamber.

3,927,938
COLOR BALANCE ADJUSTING DEVICE FOR COLOR PRINTING
Kiyoshi Seigenji, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Sept. 16, 1974, Ser. No. 506,068
Claims priority, application Japan, Sept. 24, 1973, 48-107113
Int. Cl.² G03B *27/78*; G01J *3/48*, *1/42*
U.S. Cl. 355—38 **22 Claims**



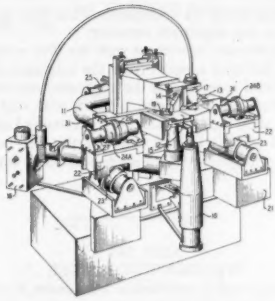
1. A color balance adjusting device for color printing, comprising:
optical means arranged to receive a color negative and including three density adjustable color compensating filters of yellow, magenta and cyan, and a light source;
photoelectric transducing means for measuring the light from said light source which has traversed a color negative inserted in said optical means, said photoelectric transducing means having three spectral sensitivites to red, green and blue;
selector means transferrable to three positions for selecting the spectral sensitivity of said photoelectric transducing means;
a first amplifying means having three amplification gain setting means alternatively selectable with the selection of respective spectral sensitivities of said photoelectric transducing means, at least two of said amplification gain setting means being adjustable, said first amplifying means having an amplification gain corresponding to the amplification gain setting means thus selected, and said first amplifying means being connected to said photoelectric transducing means; and
a first indicating means for indicating the output of said first amplifying means
whereby when said selector means are sequentially transferred, those of said amplification gain setting means, which are adjustable, are adjusted in a manner that the respective outputs of said first amplifying means in said first indicating means will be equal to each other for the respective amplification gain setting means, thereby storing the ratio of either two of the spectral energies of red, green and blue of the light from said light source, which light has been transmitted through the three color compensating filters of yellow, magenta and cyan, as well as through the color negative inserted in said optical means.

3,927,939
APPARATUS FOR REDUCING ROTATION COMPONENTS IN TABLE TRANSLATION
Kevin James Brady, Murray Hill; Victor Andrew Firtion, Secaucus; Leif Rongved, Summit, and Thomas Edward Saunders, Basking Ridge, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 27, 1973, Ser. No. 429,037
Int. Cl.² G03B *27/44*
U.S. Cl. 355—54 **10 Claims**

1. Apparatus for driving a table in a reciprocating manner with minimal rotational components comprising:

means for applying a motion to the table in an *x* direction;

means for constraining table motion comprising first and second air bearings arranged along parallel axes which extend in the *x* direction;



the distance separating the first and second bearings being longer than the distance through which the table moves;

means for supporting the table and for preventing its rotation comprising a third air bearing having an axis extending substantially in the *x* direction.

3,927,940

MANUSCRIPT SCANNING DEVICE FOR COPYING MACHINES AND THE LIKE

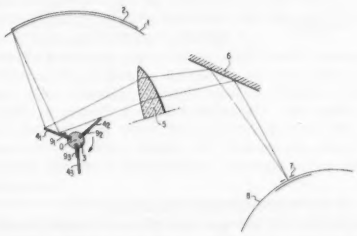
Hitoshi Kitahara, Yamato, and Jack C. Pei, Machida, both of Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 17, 1974, Ser. No. 434,104

Claims priority, application Japan, Jan. 24, 1973, 48-9465

Int. Cl.² G03B *27/70*

U.S. Cl. 355—66 **1 Claim**



1. A scanning device for a copying machine and the like, said copying machine copying an original document and including a photosensitive material driven at a predetermined speed, said scanning device comprising

means for maintaining said original document stationary;

a light source for illuminating said stationary original document;

reflecting means for directing light from said stationary original document towards the photosensitive material;

a rotatable shaft having a predetermined axis;

said reflecting means including three reflectors radially mounted at equal angular intervals on said rotatable shaft for scanning the original document by progressively directing the light from the original document towards the photosensitive material, each said reflector being fixedly mounted on said rotatable shaft and extending therefrom along an outwardly directed radial, each said reflector being covered on its reflecting side by a non-reflecting portion extending from said rotatable shaft along said reflector, the length of each of said non-reflecting portions being such as to prevent reflections from its associated reflector onto the reflector in front of it;

driving means for driving said rotatable shaft in one direction so that said reflectors successively scan the original document; and

means for mounting said document and reflectors with respect to one another so that a light ray from any predetermined point on the stationary original document is incident to and reflected from said reflectors in a plane which is substantially perpendicular to said predetermined axis of the shaft.

3,927,941

PHOTOGRAPHIC ENLARGER MIXING BOX

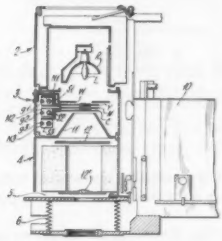
Haruki Yamaguchi, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 28, 1974, Ser. No. 484,204

Claims priority, application Japan, July 3, 1973, 48-79411; Jan. 25, 1974, 49-11440; Jan. 28, 1974, 49-12152

Int. Cl.² G03B *27/76*

U.S. Cl. 355—71 **10 Claims**



1. In a photographic enlarger having a light source and a filter box including filters and a mechanism for adjustment of said filters and a mixing box including an entrance for the light emerging from said filter box and a diffusing inside surface for mixing the light and an exit for mixed light, means for increasing the intensity of the light projected toward the peripheral area of said mixing box exit characterized in that said means for increasing the intensity of light comprises an inwardly facing reflecting surface disposed at the lower part of the inner periphery of said mixing box and said diffusing inside surface is disposed at the upper part of the inner periphery of said mixing box.

3,927,942

GRAPHICS MODIFIER

Thomas L. Byers, 3004 S.E. 21, Del City, Okla. 73115

Filed July 5, 1974, Ser. No. 486,146

Int. Cl.² G03B *27/10*

U.S. Cl. 355—84 **1 Claim**

1. A graphics modifier, comprising:

a planar base having an upper surface and having an opening in its central portion for communication with a source of vacuum;

a light sensitive sheet contiguously overlying the opening and a portion of the upper surface of said base for preventing movement of said light sensitive sheet relative to said base;

at least one stationary panel interposed between said light sensitive sheet and said base,

said stationary panel having at least one aperture communicating with the opening in said base;

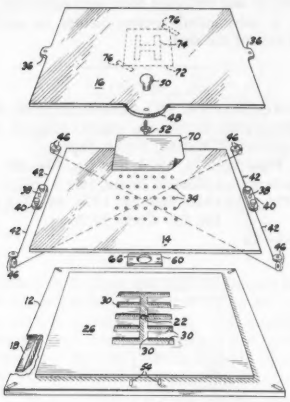
a transparent carriage panel overlying said base;

means supported by said base including a plurality of pulleys having strands entrained around the pulleys and connected with said carriage panel permitting movement of said carriage panel relative to said base and maintain-

ing the marginal edges of said carriage panel parallel with respect to adjacent marginal edges of said base;

a transparent film having at least one opaque symbol thereon interposed between said sensitive sheet and said carriage panel and secured to the latter; and,

guide means interconnecting with said base and said carriage panel for moving the latter in a predetermined pattern,



said guide means including upstanding template mounting pins on a marginal portion of the upper surface of said base,

a template having mounting pin receiving apertures,

said template having an opening in its central portion defined by inner wall surfaces describing a predetermined configuration,

a control knob secured to said carriage panel above said template, and,

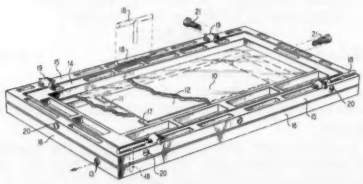
a guide mandrel secured to said control knowb and projecting into the opening of said template.

3,927,943

MASK ALIGNMENT METHOD

Karl-Heinz Pohl, Boulder, and Jack Theodore Schierle, Broomfield, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 1, 1974, Ser. No. 484,762
Int. Cl.² G03B 27/02
U.S. Cl. 355—132 **7 Claims**



1. A method for aligning first and second masks on opposite sides of a substrate, such that the masks and substrate are mutually registered, comprising the steps of:

mounting the first and second masks respectively in first and second supports;

coupling the first and second supports with an alignment member;

adjusting and fixing the orientation of the first support with respect to the alignment member;

removing the alignment member and the second support;

coating opposite sides of a substrate with photosensitive material;

mounting the sensitized substrate in a third support;

coupling the first and third supports with said alignment member;

adjusting and fixing the orientation of the third support with respect to the alignment member;

fixing the substrate in contact with the first mask;

detaching the third support from the substrate and removing the third support and the alignment member; and

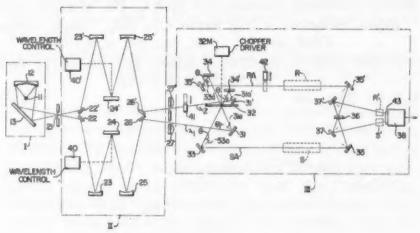
coupling the first and second supports with said alignment member such that the substrate is contained between the first and second masks, whereby the first and second masks are registered with each other and with the substrate.

3,927,944

SPECTROPHOTOMETER

Kenji Iwahashi, Osaka, and Hiroshi Yamamoto, Kyoto, both of Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Filed Dec. 18, 1973, Ser. No. 425,732
Claims priority, application Japan, Dec. 28, 1972, 48-1649
Int. Cl.² G01J 3/42
U.S. Cl. 356—97 **7 Claims**



1. A spectrophotometer comprising:

means for producing a monochromatic light beam;

optical means for causing said beam to alternately advance along a first and a second optical path which optically are symmetrical with, and substantially equivalent to, each other;

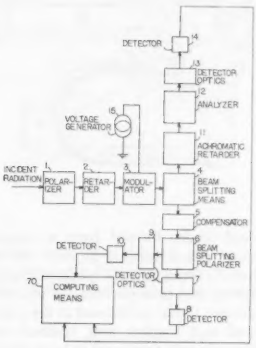
cell means disposed in each of said first and second optical paths; and

photoelectric means for receiving light transmitted through said cell means to produce a corresponding electrical signal, said monochromatic light producing means includes an exit slit and said optical means includes a reflecting chopper and a plurality of concave mirrors disposed along each of said first and second paths and arranged off-axis relative to the axis of each said optical paths so that the tangential image of the exit slit of said monochromatic light producing means is formed at the plane of said chopper with the sagittal image of said slit being axially displaced from said tangential image and the sagittal image of the pupil of said monochromatic light producing means coincides with said tangential image at said chopper plane, so that said beam has a well-defined cross-sectional area on said chopper plane.

3,927,945
OPTICAL COHERENCE AND WAVELENGTH MEASUREMENT

Harry Eugene Bates, 240½ E. Ridgewood St., Orlando, Fla. 32801

Filed Oct. 29, 1974, Ser. No. 518,759
Int. Cl.² G01B 9/02
U.S. Cl. 356—106 **11 Claims**



1. An apparatus for studying the coherence and mean wavelength of beams of optical radiation comprising:

a. optical means for polarizing the radiation;

b. means for dividing the resulting polarized beam into two independent orthogonally polarized components;

c. means for generating a phase retardation between the two independent orthogonally polarized components;

d. means for generating a time dependent modulation in the degree of phase retardation between the two independent orthogonally polarized components;

e. means for analyzing the elements of the coherency matrix of the resulting beam by measuring the intensity of the beam after passage through optical elements which project, in sequence or simultaneously, the beam into three independent states of polarization such that the three said intensities supply all information needed to calculate the three independent elements of the coherency matrix;

f. means for detecting the three independent intensities and thus converting them into electrical analogue signals; and

g. means for calculating the complex degree of coherence and mean wavelength from the three independent intensities and attendant modulation values.

3,927,946
RING LASER FREQUENCY BIASING MECHANISM

Robert E. McClure, Locust Valley, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

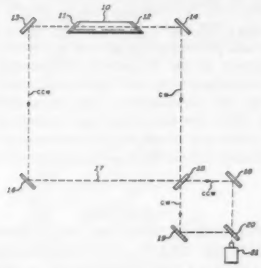
Filed Mar. 21, 1968, Ser. No. 714,891
Int. Cl.² H01S 3/10
U.S. Cl. 356—106 LR **6 Claims**

1. A ring laser comprising

means forming a closed loop optical path comprising a mirror including a magnetically saturable member magnetized in a direction perpendicular to the plane of said optical path,

an active laser medium positioned in the closed loop path for propagating contra-directional light waves therein, said light waves being plane polarized parallel to the plane of said path,

means for extracting from the optical path a portion of the energy in each of the contra-directional waves, and

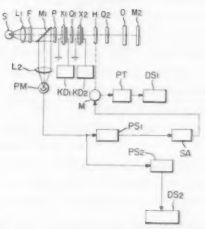


means for combining the extracted wave energies to produce an electrical signal having a frequency equal to the frequency difference between said extracted wave energies.

3,927,947
POLARIZATION ANALYSER DEVICE

Toshiyuki Kasai, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Nov. 7, 1974, Ser. No. 521,923
Claims priority, application Japan, Nov. 12, 1973, 48-126183
Int. Cl.² G01N 21/40
U.S. Cl. 356—117 **7 Claims**



1. A reciprocally movable polarization analyser device comprising a light source (**S**), a condenser lens (**L1**) for forming the light from said source into a parallel light beam, a monochrome filter (**F**) for forming the light from said lens into a predetermined wavelength of light, a polarizer (**P**) for forming the light from said filter into linearly polarized light, a light modulator (**X1**) disposed with its principal axial azimuth maintained at 45° with respect to the axial azimuth of said polarizer (reference azimuth), an oscillator (**KD1**) for applying a predetermined frequency of alternating current to said light modulator to thereby impart, in cooperation with said modulator, a phase difference modulation to the light as it passed therethrough, a first ¼ wavelength plate (**Q1**) disposed subsequently to said light modulator with its axial azimuth maintained at said reference azimuth, a ½ wavelength plate (**H**) disposed subsequently to said first ¼ wavelength plate and for rotation about the optical axis, a second ¼ wavelength plate (**Q2**) disposed subsequently to said ½ wavelength plate with its axial azimuth maintained at 45° with respect to said reference azimuth, a sample object (**0**) to be measured disposed perpendicularly to the optical axis with its azimuth maintained at 45° with respect to said reference azimuth, a mirror (**M2**) for reflecting the light once passed through said sample (**0**) to cause said light to travel back along the same optical path, a half-mirror (**M1**) disposed between said monochrome filter

and said polarizer for reflecting the light reflected by said mirror (M2) and passed through said polarizer (P), photoelectric converter means (PM) for receiving the light from said half-mirror and converting the same into an electrical signal, a servo-motor (M) for rotating said ½ wavelength plate (H), tuning means (PS1, SA) for deriving, from said electrical signal from said photoelectric converter means, a signal of the same frequency as the frequency component of the phase difference modulation by said light modulator and applying said signal to said servo-motor, and phase difference display means (PT, DS1) for detecting the amount of revolution of said servo-motor and displaying the value of the phase difference (Δ) of said sample from said amount of revolution.

3,927,948

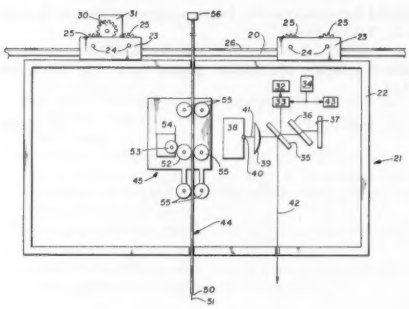
APPARATUS FOR PRODUCING DATA INDICATIVE OF THE GEOMETRIC SHAPE AND ARRANGEMENT OF THE VARIOUS COMPONENTS OF A MODEL

Leonard C. Cox, 8907 Bonhomme, Houston, Tex. 77036, and Joe B. Wyatt, 6111 Yarwell, Houston, Tex. 77035

Continuation of Ser. No. 263,129, June 15, 1972, abandoned. This application Dec. 3, 1973, Ser. No. 420,760

Int. Cl.² G01B *11/00, 9/02*

U.S. Cl. 356—167 **6 Claims**



1. An apparatus for producing data indicative of the geometric shape and arrangement of the various components of an irregular shaped model, comprising:

a receiving means for supporting the model;

a scanning means; and

means for moving the scanning means through substantially all of a selected area of a plane, which plane is positioned in a selected spaced relationship with the receiving means supporting the model;

the scanning means including:

light modulation means for determining within a selected range of accuracy the distance between the scanning means and selected points on the surface of the model exposed to the scanning means as the scanning means through the selected area of the plane and for generating an electrical signal representative thereof. and

interferometer means for determining, within a selected magnitude of distance, changes in the distance between the scanning means and selected points on the surface of the model as the scanning means moves through the selected area of the plane and for generating an electrical signal representative thereof;

the light modulation means and the interferometer means coacting with the moving means to produce output data indicative of the surface of the model exposed to the scanning means in a three-dimensional coordinate system.

3,927,949

PLASTIC HINGES

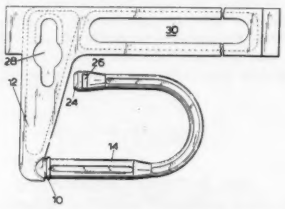
Colin W. F. Clinch, Woodley, England, assignor to ITW Limited, Slough, England

Filed Sept. 18, 1974, Ser. No. 507,027

Claims priority, application United Kingdom, Sept. 17, 1973, 43500/73

Int. Cl.² B42F *3/02*

U.S. Cl. 402—22 **2 Claims**



1. A loose-leaf binder formed from a one-piece plastic molding including a base portion, at least one bracket arm extending outwardly substantially perpendicular from and being coplanar with said base portion and including an aperture with a restricted throat positioned at the juncture of said base portion and said bracket arm, resilient integral arch means extending upwardly from said at least one bracket arm adjacent its free extremity removed from said base portion, said arch means being deformable and at least initially having a generally U-shaped configuration with one end of the arch means permanently affixed to said bracket arm at said free extremity by a web forming a resilient hinge means, said bracket arm adjacent an edge thereof having a recess facing toward the web, and a lip bounding the recess at one side and directed towards the web, and said one end of said arch means including a rigid portion having a rib directed away from the web, the relative distances of the lip and rib from the web being such that relative rotation of said arch means and said bracket arm in one direction pivoted about said web will cause the rib and lip to engage each other and continuation of the rotation in that direction will cause the rib and lip to ride past each other until the rib lies in the recess and below said lip in retained relationship, said arch means formed having cooperative means at its opposite extremity for telescopic introduction into said aperture and adapted to cooperate with said restricted throat for releasable fixment therewith, said aperture throat being in the form of a keyhole slot and said cooperative means at the free end of the arch means being slotted and adapted to have said slotted end moved into the restricted throat of the keyhole slot, said arch means being initially molded in a flat position generally parallel to said base portion and co-planar with the base portion and said bracket arm and is adapted to be rotatably moved into a position by said hinge means perpendicular to a plane passing through said base portion and bracket arm and locked in place by said rib and lip located on the bracket arm and the arch means at adjacent ends thereof.

3,927,950

HALF-LAPPED TUBE JOINT

John R. Herrmann, Tustin, and Robert L. Alexander, Newport Beach, both of Calif., assignors to G.S. Beckwith Gilbert, Greenwich, Conn.

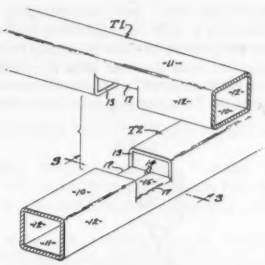
Filed Jan. 24, 1975, Ser. No. 543,825

Int. Cl.² F16B *7/04;* **F16D** *1/00;* **B25G** *3/00*

U.S. Cl. 403—346 **9 Claims**

1. A notch in an elongated hollow member having a planar top wall and spaced planar and parallel side walls depending from the top wall, portions of the top wall and spaced side walls being displaced along transverse and vertically disposed

shear lines respectively, the center of the top wall being folded downwardly, the displaced side wall portions being folded inwardly to a plane disposed beneath and parallel to the remaining top wall, and the displaced top wall portion being disposed in the form of a fold depending from the notch bottom established by the two displaced and juxtaposed side wall portions.



3,927,951

WATER TURBINE

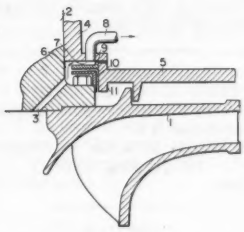
Yoshiyasu Mitsuhashi, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Aug. 27, 1974, Ser. No. 500,878

Claims priority, application Japan, Aug. 28, 1973, 48-100793

Int. Cl.² F16J *15/50;* **F04D** *9/00*

U.S. Cl. 415—110 **4 Claims**



1. In a water turbine of the type wherein when the turbine is started to operate as a pump, pressurized air is introduced into the turbine chamber, and then the air therein is discharged through a conduit provided for the shaft of the turbine, through an annular chamber about said shaft and a discharge pipe opening into said annular chamber, the improvement which comprises an annular member for dividing said annular chamber into upper and lower sections, means for securing the outer periphery of said annular member to the outer side wall of said annular chamber, means for connecting said discharge pipe to the upper section, and means for defining a gap between the outer periphery of said shaft and the inner periphery of said annular member for permitting free flow of the air, whereby when said shaft is rotated the water entering into the lower section is forced radially outwardly.

3,927,952

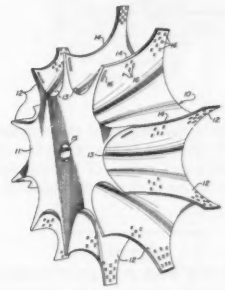
COOLED TURBINE COMPONENTS AND METHOD OF MAKING THE SAME

Robert F. Kirby, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 20, 1972, Ser. No. 308,188

Int. Cl.² F01D *5/18*

U.S. Cl. 416—95 **3 Claims**



1. A turbine wheel of the type having a hub portion and thin blades projecting radially therefrom, said blades and said hub portion defining grooves between said blades through which hot gases flow after impinging on the sides of the blades, said turbine wheel comprising:

a. a plurality of thin flat sheets, each of said sheets having a central portion corresponding to the hub of the turbine wheel and a plurality of projections extending outwardly from said central portion, said projections being substantially equally spaced around the circumference of said central portion and corresponding to said blades;

b. said sheets each having a central opening;

c. said sheets being stacked together in fact-to-face relation with said central opening and said radial projections of each sheet being aligned with the projections and central opening of adjacent sheets;

d. bonding means between each one of said adjacent sheets for securing said sheets together over the entire surface of engagement between said sheets to form a unitary turbine wheel;

e. at least one pair of said sheets having slots therein, one of said pair of sheets having a slot extending from said central opening into one of said radial projections of said one sheet and the other of said pair of sheets having a slot inclined with respect to a radius of said wheel extending from the edge of said other sheet across said projection and intersecting said slot in said one sheet, whereby said pair of slots provides fluid communication between said central opening and the channel between adjacent blades of said turbine wheel.

3,927,953

GETTER DEVICE AND METHOD OF USE

Mario Zucchinelli, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed May 15, 1974, Ser. No. 470,183

Claims priority, application Italy, May 18, 1973, 24291/73

Int. Cl.² F04B *37/02*

U.S. Cl. 417—48 **2 Claims**

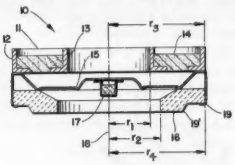
1. A getter assembly comprising:

A. an annular container,

B. a getter metal vapor releasing material within the container,

C. an annular support attached to the bottom of the container, said annular support having an inner radius and an outer radius

1. said annular support being of a material of low thermal conductivity,
2. said annular support being of a material of high resistance to heating by induction currents,



3. wherein the inner radius of the annular support is greater than the inner radius of the annular container,
4. wherein the outer radius of the annular support is substantially equal to the outer radius of the annular container.

3,927,954

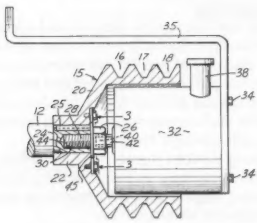
POWER TAKE-OFF FOR POWER STEERING PUMP

Fred W. Walker, 262 W. Chaparral St., Rialto, Calif. 92370

Continuation-in-part of Ser. No. 377,715, Sept. 7, 1973, abandoned. This application Sept. 20, 1974, Ser. No. 507,940

Int. Cl.² F04B *17/00*

U.S. Cl. 417—360 **9 Claims**



1. In an automotive vehicle wherein a power shaft extending from the prime mover of the vehicle actuates a power steering pump together with a plurality of other components, the improvement for saving space, promoting safety, reducing the load on the prive mover, and reducing cost, comprising:

said power steering pump extending axially from the end of the power shaft and being close coupled therewith for actuation thereby;

means mounted on the vehicle in supporting engagement with the pump; and

an assembly of pulley elements for driving said plurality of components by means of belts;

said pulley elements being united with each other and being united with said power shaft axially thereof for actuation thereby;

said pulley elements being hollow and enclosing at least a substantial part of said pump.

3,927,955

MEDICAL CASSETTE PUMP

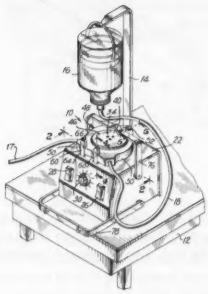
Dominic Spinosa, Wantagh, and John Varga, Bayville, both of N.Y., assignors to East/West Medical Products, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 174,019, Aug. 23, 1971, abandoned. This application July 9, 1973, Ser. No. 377,677

Int. Cl.² F04B *43/08*, *43/12*, *45/26*

U.S. Cl. 417—477 **33 Claims**

1. A medical cassette pump comprising in combination a driving means; a fluid-pumping assembly operatively coupled to the drive means for rotation thereby about a principal axis, said fluid-pumping assembly including a pumping means rotatable about the principal axis; cassette means movable between a first position towards and a second position away from the pumping means; means defining at least one wall of a channel for reception of a fluid-carrying tube; the wall restraining the tube from movement away from the pumping means and retaining the tube in a path corresponding to the rotational path of the pumping means in close proximity to the pumping means in a manner such that the tube is collapsed by the pumping means against the wall; the cassette means in the first position retaining the fluid-carrying tube in the channel and in



a position to be collapsed by the pumping means, and in the second position releasing the tube from such engagement to permit insertion of the tube in the channel or removal of the tube from the channel, and the pumping means in said first position of the cassette means being always in engagement with the tube at some portion along the tube for pumping of fluid through the tube upon rotation of the drive means; said cassette means comprising a pair of cassette half-members each describing an approximately 180° arc and pivotably mounted at one end in a manner such that, when brought together, they extend through an approximately 360° arc about the fluid-pumping drive assembly and having an inside wall defining one wall of the channel.

3,927,956

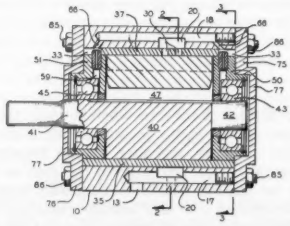
FLUID ACTUATED MOTOR

Harley E. Linthicum, Springfield, Ohio, assignor to Carrier Corporation, Syracuse, N.Y.

Filed May 30, 1974, Ser. No. 474,624

Int. Cl.² F01C *21/04*

U.S. Cl. 418—100 **3 Claims**



1. In a fluid operated rotary motor of the type wherein a rotor having radially slidable vanes is eccentrically mounted in a cylindrical bore of a casing, end caps having eccentrically located recesses mounted in each end of the cylindrical bore, bearings mounted in the recesses of the end caps and supporting the rotor, end plates mounted on each end of the casing,

fluid supply ports through the casing in communication with the interior of the cylindrical bore and an exhaust port also communicating with the insides of the cylindrical bore, the improvement comprising:

means in said end caps to allow passage of fluid containing lubricant from the cylindrical bore to the bearings; and

means to allow passage of the fluid from the bearings to the exhaust port whereby lubricant in the fluid supply is deposited on the bearings and the pressure is equalized on both sides of the end caps.

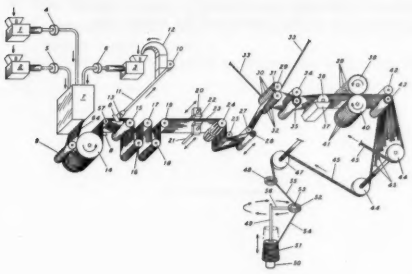
3,927,957
APPARATUS FOR MAKING YARN FROM POLYMER FILM

Leonard Chill, Waynesboro, Va.; Gordon B. Johnson, Sausalito, and Carl S. Weisner, Pleasant Hill, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 317,502, Dec. 21, 1972, Pat. No. 3,807,918. This application Feb. 11, 1974, Ser. No. 441,700

Int. Cl.² B29D *7/02, 7/20;* **B29F** *3/12*

U.S. Cl. 425—131.1 **2 Claims**



1. Apparatus for forming yarn from thermoplastic polymers comprising die means for extruding a continuous sheet of multicolored film from thermoplastic polymer stock, orientation means for orienting said continuous sheet of multicolored film in the longitudinal direction, cutting means for cutting said continuous sheet of multicolored film along the longitudinal direction to form strips of film of fixed widths, oscillating means for oscillating said continuous sheet of multicolored film transverse to the longitudinal direction upstream of said cutting means, means for fibrillating said strips of film, means for twisting said fibrillated strips of film to form yarn and means for collecting said yarn.

3,927,958
RECIRCULATING COMBUSTION APPARATUS

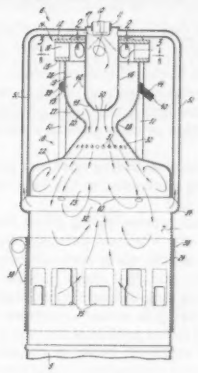
Ronald E. Quinn, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 29, 1974, Ser. No. 518,518

Int. Cl.² F23M *9/06*

U.S. Cl. 431—116 **3 Claims**

1. A combustion liner for a gas turbine engine combustion apparatus or the like having an upstream end and a downstream outlet end and including wall means defining, in flow sequence from the upstream end of the liner, a fuel vaporizing prechamber, a convergent-divergent passage having a throat, a reaction chamber, and a dilution section, means for admitting fuel and combustion air into the prechamber and thence through the convergent-divergent passage into the reaction chamber, and means for admitting dilution air into the dilution section, wherein the improvement comprises a manifold on the reaction chamber wall to receive combustion products, a centerbody extending axially of the prechamber and having an outlet into a region of relatively low static pressure upstream of the throat in the convergent-divergent passage, and recirculation conduit means connecting the manifold to the centerbody, so that combustion products are recirculated from the



reaction zone through the manifold, conduit means, centerbody, and convergent-divergent passage into the reaction zone.

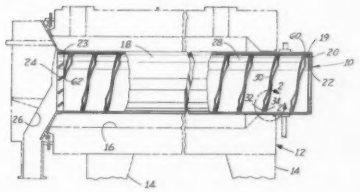
3,927,959
FREE FLOATING FLIGHT IN A RETORT AND METHOD

Harold E. Mescher, Pico Rivera, and Walter E. Heyer, Los Alamitos, both of Calif., assignors to Pacific Scientific Company, City of Commerce, Calif.

Filed Sept. 6, 1974, Ser. No. 503,731

Int. Cl.² F27D *1/16;* **F27B** *7/14*

U.S. Cl. 432—3 **13 Claims**



1. A heat treatment device for treating workpieces, and device comprising:

a heating surface;

guide means located on said heating surface for directing said workpieces along said heating surface; and

means connected to and extending away from said heating surface adjacent said guide means for maintaining the location of said guide means on said heating surface, said maintaining means allowing said guide means to move relative and substantially normal to said heating surface so that any temperature differential between said heating surface and said guide means will not cause thermal stress cracks in said heating surface and said guide means adjacent their interface.

11. A method of placing a helical flight on the interior surface of a cylindrical heat treating retort, said method comprising the step of positioning said helical flight on said surface by a pair of spaced helical strips secured on the surface in a manner to confine the flight while allowing the flight to move relative to said retort.

3,927,960

ROTARY KILN

William Christian Endersen, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Mar. 27, 1972, Ser. No. 238,323

Claims priority, application United Kingdom, Apr. 19, 1971, 9808/71

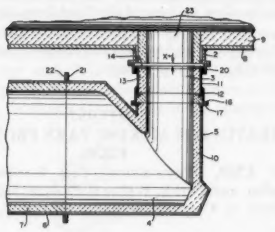
Int. Cl.² F27D *15/02;* **F27B** *7/38;* **F16L** *21/00*

U.S. Cl. 432—80 **9 Claims**

1. A rotary kiln having at least one planetary cooler tube in communicating relation with an outlet portion thereof and a junction piece connecting the outlet portion of the kiln with the inlet end portion of each planetary cooler tube, comprising:

a. a first shell section having open end portions, a first end portion being connected to the inlet end portion of the cooler tube; and

b. a second shell section having a first inner member communicating with a second outer member, at least a portion of the second outer member being in overlapping relation with said first inner member, said first inner member being tack-welded thereto, said first inner member further being in sealed communicating spaced relation with the outlet portion of the rotary kiln and said first and second members being in communicating relation with the second end portion of said first shell section, said members being further secured to each other by at least one fully welded joinder portion extending over at least a portion of the tack welded portion and in superposed relation therewith to form a communicating section between the rotary kiln and the first shell section, while the spaced relation between the first inner member and the outlet portion of the rotary kiln permits freedom of movement of the inlet portion of the inner member with respect to the outlet portion of the rotary kiln.



3,927,961

DYEING AND MONOMER POLYMERIZATION IN PROTEIN FIBER WITH METAL CATALYST AND TRICHLOROACETIC ACID OR SALT THEREOF

William Stanley Simpson, Christchurch, New Zealand, assignor to Wool Research Organisation of New Zealand, Inc., Christchurch, New Zealand

Filed July 6, 1972, Ser. No. 269,398

Claims priority, application United Kingdom, July 13, 1971, 32834/71; July 13, 1971, 32835/71

Int. Cl.² D06P 5/00

U.S. Cl. 8—17 9 Claims

1. A combined dyeing and polymer deposition process for protein fibers which comprises the steps of:

applying to the fibers a dyestuff, at least one polymerizable olefinic monomer of the formula:

$$CH_2 = CR_5R_4$$

wherein R_4 represents hydrogen, methyl or ethyl and R_5 represents halogen, cyano, phenyl, $-CONH_2$ or $-COOR_6$ wherein R_6 represents an alkyl or alkenyl group of 1 to 3 carbon atoms,

and a catalyst comprising a complex compound of at least one of the metals copper, iron, chromium, manganese, vanadium, cobalt, nickel or aluminum and trihaloacetic acid or a salt thereof,

and causing said monomer to polymerize within said fibers.

3,927,962

NON-DISCOLORING FLAME RESISTANT WOOL

Mendel Friedman, Moraga; John F. Ash, El Cerrito, both of Calif., and Willie Fong, deceased, late of Richmond, Calif. (by Yukiye Fong, executrix), assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 17, 1974, Ser. No. 489,312

Int. Cl.² D06M 3/02, 13/00; D06P 5/00, 7/00

U.S. Cl. 8—17 5 Claims

1. A process for modifying wool to make it flame resistant, which comprises:

a. contacting the wool with an aqueous dispersion containing about 2 to 12%, owf, of a compound selected from the group consisting of tetrabromophthalic anhydride, tetrabromophthalic acid, tetrachlorophthalic anhydride, and tetrachlorophthalic acid, at about 100° C., and

b. rinsing the wool and drying it.

5. A process for concomitantly dyeing wool and for modifying wool to make it flame resistant, which comprises:

a. providing an aqueous acidified dyebath containing a wool dye,

b. entering the wool into the dyebath and heating it to the boiling point,

c. adding tetrabromophthalic acid in the amount of about 2 to 12%, based on the weight of wool, to the dyebath, and continuing boiling until the wool adsorbs about 2 to 8%, based on the weight of wool, of tetrabromophthalic acid, and

d. removing the treated wool from the dyebath, then rinsing and drying it.

3,927,963

HYDROSOLUBLE TRISAZOIC DYES, MIXTURES THEREOF, AND THE USE THEREOF

Sisto Papa, Milan; Ugo Moiso, Saronno (Varese), and Renzo Ferrario, Ceriano Laghetto, (Milan), all of Italy, assignors to Aziende Colori Nazionali Affini ACNA S.p.A., Milan, Italy

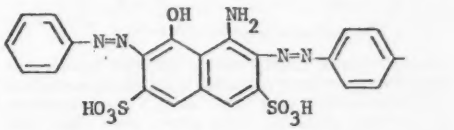
Filed Apr. 1, 1974, Ser. No. 456,948

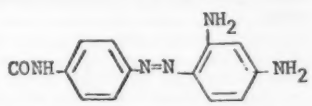
Claims priority, application Italy, Mar. 27, 1973, 22204/73

Int. Cl.² C09B 27/00, 45/48, 31/16, 33/18

U.S. Cl. 8—26 4 Claims

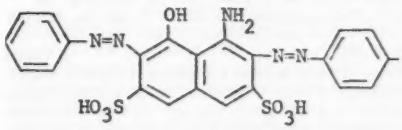
1. A mixture of hydrosoluble trisazo-dyes consisting of from 35–60% of a compound of the formula:

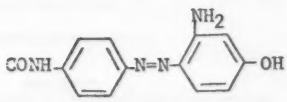




(I),

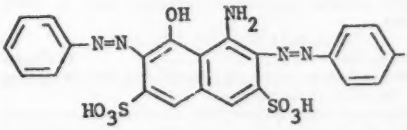
from 35–60% of a compound of the formula:

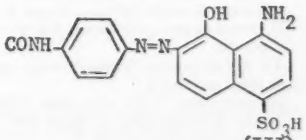




(II)

and from 5–15% of a compound of the formula:





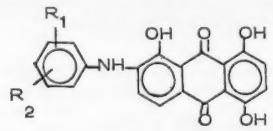
(III)

3,927,964
6-ANILINO-1,4,5-TRIHYDROXYANTHRAQUINONES

Raouf Botros, Beech Creek, Pa., assignor to American Aniline Products, Inc., Lock Haven, Pa.

Filed June 28, 1973, Ser. No. 374,772
Int. Cl.² C09B *1/00*, *5/62*; D06P *1/20*, *5/00*
U.S. Cl. 8—39 4 Claims

1. An aromatic polyester textile material dyed with a compound of the formula



each of R_1 and R_2 is independently hydrogen, chlorine, bromine, alkyl having from 1–8 carbon atoms, alkoxy having from 1–8 carbon atoms, hydroxy(lower alkyl), N-lower alkylamino, N,N-di-lower alkylamino, lower alkoxy lower alkyl, lower alkoxy lower alkoxy and acylamido having up to 7 carbon atoms.

3,927,965
DIRECT AND ACID DYES WITH THE SAME DYE CHLORINE DECOLORED AS LEVELLER

Longinas Lasas, Los Angeles, Calif., assignor to United States Gypsum Company, Chicago, Ill.

Division of Ser. No. 271,967, July 14, 1972, Pat. No. 3,807,947. This application Dec. 17, 1973, Ser. No. 425,368
Int. Cl.² D06P *1/620*
U.S. Cl. 8—89 3 Claims

1. A novel dyestuff solution comprising an aqueous suspension including (1) dyestuff selected from the group consisting essentially of acid and direct dyes and (2) a leveling dyeing assistant obtained from halogen decolorization of said dyestuff.

3,927,966
PROCESS OF PRODUCING A FATLIQUORING CHROME TANNING AGENT, COMPOSITION CONTAINING SAME AND METHOD OF USING SAME

Rolf Leberfinger, Holzgerlingen, and Heinz Matschkal, Gaertringen, both of, assignors to Schill & Seilacher, Boeblingen, Germany

Filed Nov. 6, 1974, Ser. No. 521,509
Claims priority, application Germany, Nov. 7, 1973, 2355503
Int. Cl.² C14C *5/00*, *3/04*, *3/06*
U.S. Cl. 8—94.2 18 Claims

1. In a process of producing a fatliquoring chrome-tanning agent, the steps which comprise

a. heating an aqueous chromium sulfate solution in mixture with an aqueous solution of an alkyl sulfonate, the alkyl residue of which contains at least 8 carbon atoms, and

b. atomizing and spray-drying said mixture of solutions to a powder.

12. A fatliquoring chrome-tanning agent in powder form, said agent containing

between about 93.0% and about 53.0% of chromium sulfate, corresponding to about 24% to about 14.0% of chromium trioxide and

between about 6.0% and about 23.0% of an alkyl sulfonate, the alkyl moiety of said alkyl sulfonate having at least 8 carbon atoms.

3,927,967
PHOTOACTIVATED BLEACHING PROCESS AND COMPOSITION

Peter Roscoe Hartley Speakman, Newcastle-Upon-Tyne, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 259,326, June 2, 1972, abandoned. This application July 6, 1973, Ser. No. 377,169
Claims priority, application United Kingdom, July 10, 1972, 32222/72
Int. Cl.² D06L *3/02*, *3/04*, *3/00*, *3/06*
U.S. Cl. 8—103 18 Claims

1. A process for removing stains from textiles which comprises

a. treating the textiles in the presence of oxygen with an aqueous liquor containing

i. a concentration of from 0.2 to 2.0 grams per liter of organic detergent;

ii. a concentration of from 0.2 to 2.0 grams per liter of alkaline detergency builder; and

iii. a concentration of from 1 to 50 mg. per liter of a photoactivator selected from the group consisting of eosin, rose bengal, fluoroscein, chlorophyll, metal-free porphyrin, sulfonated phthalocyanine, and sulfonated zinc phthalocyanine; and

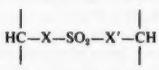
b. simultaneously irradiating the textiles with visible light which includes light of wavelength 640 nm and higher.

3,927,968
PROCESS FOR PRODUCING AN ION-EXCHANGEABLE AND SOLVENT-RESISTANT FILAMENTARY STRUCTURE

Hideaki Suzuki, Machida; Haruo Togawa, Koganei; Akira Omori, Sagamihara, and Naoki Yamamoto, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

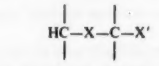
Filed May 8, 1973, Ser. No. 358,327
Claims priority, application Japan, May 10, 1972, 47-45346
Int. Cl.² D06M *11/02*
U.S. Cl. 8—115.5 5 Claims

1. A method for producing a solvent-resistant filamentary structure, which comprises reacting a filamentary structure comprising at least 20 percent by weight of aromatic nuclear structural units derived from an aromatic monovinyl monomer with chlorosulfonic acid to form a cross-linked structure in which 2 to 40 out of 100 of the aromatic nuclear structural units are cross-linked by crosslinkages of the formula (I)



(I)

wherein X and X′ are the same or different and each represent aromatic nuclear structural units derived from an aromatic monovinyl monomer and which does not contain crosslinkages expressed by the following formula

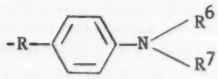


wherein X is the same as defined with respect to (I) and X′ is the same as defined above or a hydrogen atom,

reacting the cross-linked filamentary structure with a reagent capable of introducing an ion-exchangeable group selected from the group consisting of a sulfonic acid group, —COR.-COOH wherein R is an alkylene group containing 1 to 4 carbon atoms or a phenylene group, a carboxyl group, an alkali metal salt of any of the above-cited groups,

wherein R^1, R^2 and R^3 are the same or different and each represent an alkyl group having 1 to 4 carbon atoms, a phenyl group or β-hydroxyethyl group,

wherein R^4 and R^5 are the same or different, and each represent a hydrogen atom, an alkyl group containing 1 to 4 carbon atoms, a phenyl group or a β-hydroxyethyl group,



wherein R^6 and R^7 are the same or different and each represent a hydrogen atom or a methyl group, $-CH_2-NHCH_2CH_2)_n NH_2$ wherein n is an integer of 1 to 5, and $-CH_2NH-CH_2)_m NH_2$ wherein m is 1 or an integer of 3 to 6,

into a part or whole of the remainder of the aromatic nuclear structural units.

3,927,969

INSECTPROOFING WOOL WITH ZINC ACETATE

Nathan H. Koenig, Albany, and Mendel Friedman, Moraga, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 24, 1973, Ser. No. 399,873
Int. Cl.² D06M *3/02, 13/00*
U.S. Cl. 8—128 R **4 Claims**

1. A process for preparing modified wool which has increased resistance to insects, which comprises reacting wool with zinc acetate in the presence of N,N-dimethylformamide at a temperature of about from 105° to 120° C. until there is attained a weight increase by the wool of about from 5 to 20%.

3,927,970

LIQUID LAUNDRY BUILDER CONTAINING ALKALI HYDROXIDE AND BORAX

John D. Ciko, Allen Park, and John J. Cramer, Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 12, 1973, Ser. No. 415,238
Int. Cl.² C11D *9/16, 7/06, 7/10*
U.S. Cl. 8—137 **9 Claims**

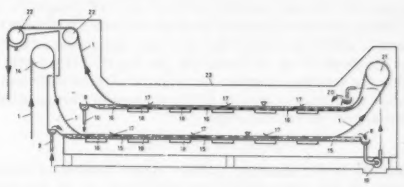
1. In a method of cleaning fabrics with an aqueous solution containing alkali metal hydroxide builder selected from the group consisting of sodium hydroxide and potassium hydroxide, the improvement wherein borax is included in said aqueous solution in an amount from about 5 to 15 weight percent of the amount of said hydroxide present, thereby forming in situ alkali metal matabarate in an amount from about 6.5 to 19.5 weight percent of the amount of said hydroxide initially present.

3,927,971

PROCESS FOR THE CONTINUOUS FINISHING TREATMENT OF TEXTILE WEB MATERIALS

Christian August Meier-Windhorst, 2101 Lindhorst uber Hamburg-Harburg, Germany

Continuation-in-part of Ser. No. 136,275, March 16, 1971, abandoned, which is a division of Ser. No. 845,677, July 23, 1969, abandoned. This application Mar. 4, 1974, Ser. No. 448,119
Int. Cl.² D06B *3/06*
U.S. Cl. 8—151.2 **15 Claims**



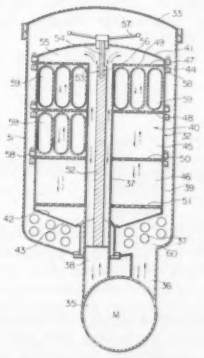
1. Process for the continuous liquid treatment of wide webs of textile material wherein the textile web is contacted with a treating liquid which remains in a stable chemical and physical state during the process, which comprises preheating said treating liquid to treatment temperature, applying to each unit length of a moving textile web said treating liquid which travels in the same direction as the web, the rate of movement of web and liquid being such that substantially complete absorption of the treating agent by said textile web takes place during the treating operation.

3,927,972

PROCESS FOR TREATING FIBROUS ARTICLES WITH AN AQUEOUS TREATING LIQUID

Sadao Kawamura; Akira Hayakawa, and Harutoshi Kurokawa, all of Kyoto, Japan, assignors to Toray Industries, Inc., Japan

Division of Ser. No. 234,152, March 13, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,109
Claims priority, application Japan, Mar. 15, 1971, 46-13678
Int. Cl.² D06B *5/16, 21/00*
U.S. Cl. 8—155.2 **12 Claims**



1. A process for treating fibrous articles consisting of bulky yarns with an aqueous treating liquid, comprising:

a. providing a stratiform treating chamber having a thickness L_1 defined by a pair of horizontally extending partitions having apertures therethrough to permit the flow of

treating liquids through the treating chamber along the thickness dimension;

b. providing fibrous articles, consisting of bulky yarns, to be treated;

c. charging the treating chamber with the fibrous articles to form a stratum of fibrous articles having an uncompressed thickness in the atmosphere less than L_1, an apparent density in the atmosphere of about 0.09 to 0.16 g/cm³, and an uncompressed thickness L_2 in the treating liquid, where

$$L_1 < 1.5L_2,$$

in order to effect a resistance to the flow of the treating liquid through the treating chamber of about 0.2 to 0.5 Kg/cm²; and

d. flowing the treating liquid through the treating chamber in alternate directions along the thickness dimension at a flow rate of about 10 to 30 litres/min per Kg of fibrous articles within the treating chamber for a period of time sufficient to change the apparent density of the stratum of fibrous articles according to the relationship

$$\rho_n\rho_o = 1.0 \text{ to } (\alpha+\beta/\rho_o)$$

where ρn is the apparent density of the stratum of fibrous articles in the atmosphere after treatment, ρo is the initial apparent density of the stratum of fibrous articles in the atmosphere before treatment, α is about 0.62 to 0.63 and β is about 80 to 90.

3,927,973

METHOD FOR COLORING FIBROUS MATERIAL COMPOSED OF PHENOLIC RESINS

Syunya Ida, Nara, and Norio Endo, Osaka, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Filed Apr. 17, 1973, Ser. No. 351,884

Claims priority, application Japan, Apr. 20, 1972, 47-40115

Int. Cl.² D06P *5/04*

U.S. Cl. 8—173 **7 Claims**

1. A method for coloring fibers or fibrous structures composed of phenolic resins, which comprises:

a. applying a dye liquor to said fibers or fibrous structures;

b. drying the resulting fiber or fibrous structures; and

c. contacting the dried fiber or fibrous structures with a mixed vapor of water and at least 5% by weight, based on the total weight of the mixed vapor, of benzyl alcohol.

3,927,974

METHOD FOR STERILIZING LIQUIDS

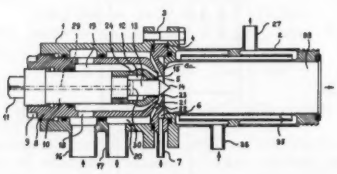
Bjorn-Olow Johansson, Lomma, and Bengt Arne Palm, Genarp, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Oct. 9, 1973, Ser. No. 404,622

Claims priority, application Sweden, Oct. 13, 1972, 13203/72

Int. Cl.² A23C *3/02*, *3/04*; A23L *3/16*

U.S. Cl. 21—56 **2 Claims**



1. In the sterilizing of a liquid containing heat degradable biological material by contacting with each other, in a jet nozzle locus, two annular and concentric jets of steam and said liquid, respectively, thereby forming an annular jet of steam-heated liquid in said locus, the improvement which comprises forming two additional annular jets of cold liquid concentric to said first-mentioned jets of steam and liquid, and directing said additional jets along both the inside and the outside of said annular jet of steam-heated liquid, whereby material from the liquid to be sterilized is prevented from burning onto surfaces of the jet nozzle locus.

3,927,975

SYSTEM FOR SUPPRESSING LIQUID SULFUR TRIOXIDE

Clark A. Sumner, Santa Ana, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 26, 1974, Ser. No. 500,216

Int. Cl.² B01J *1/18*

U.S. Cl. 21—60.5 **4 Claims**

1. A method for substantially reducing the formation of sulfuric acid aerosol smoke from liquid sulfur trioxide after a spill of said liquid sulfur trioxide, comprising the steps of:

a. Confining the liquid sulfur trioxide;

b. Applying to the top surface of said liquid sulfur trioxide spill an inert non-reactive and immiscible oil which has been slurried with a predetermined amount of inert solid diluent to adjust the specific gravity thereof to less than that of liquid sulfur trioxide; said inert non-reactive and immiscible oil defined as a linear polymer having the formula

wherein X is selected from the group consisting of chlorine and fluorine.

3,927,976

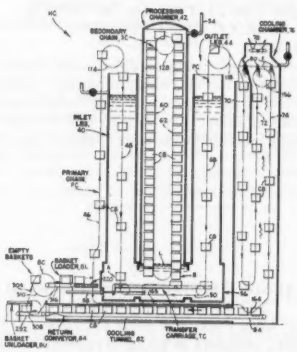
CONTAINERIZED HYDROSTATIC STERILIZING SYSTEM

James L. Reimers, Saratoga, and Rodney D. Miller, San Jose, both of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Sept. 26, 1973, Ser. No. 400,997

Int. Cl.² A23L *3/00*, *3/04*; B65B *55/02*

U.S. Cl. 21—80 **15 Claims**



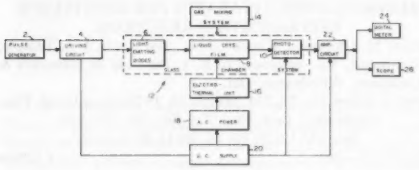
1. In a sterilizer of the hydrostatic type for products in containers, said sterilizer having inlet and outlet water legs, an intermediate steam processing leg, water leg means for interconnecting the lower ends of said legs, means for conveying containers through the sterilizer comprising chain means running through said legs, product carriers spaced along said chain means and means for driving said chain means; the improvement wherein said conveying means comprises endless primary chain means running through said inlet and outlet legs, secondary chain means running through said processing leg, supports for detachably mounting product carriers uni-

formly spaced along said primary chain means at one spacing and similar supports uniformly spaced along said secondary chain means at a much closer spacing, said chain driving means comprising means for driving said primary and secondary chain means in synchronism and for driving said primary chain means at a higher speed than that of said secondary chain means, transfer means disposed in said interconnecting water leg means for transferring product carriers from carrier supports on a reach of said primary chain means that is leaving said inlet water leg to carrier supports on a reach of said secondary chain means that is entering said processing leg and for transferring product carriers from carrier supports on a reach of said secondary chain means that is leaving said processing leg to carrier supports on a reach of said primary chain means that is entering said outlet water leg.

3,927,977
LIQUID CRYSTAL GAS ANALYZER

John E. Jacobs, Evanston, Ill., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 507,991
Int. Cl.² G01N *31/06, 33/16*; G02F *1/01, 1/13*
U.S. Cl. 23—230 LC **7 Claims**



1. A liquid crystal gas analyzer comprising:

liquid crystal film;

illuminating means for illuminating the liquid crystal film, said illuminating means including first and second light emitting diodes;

detector means for detecting the intensity of light reflected from the liquid crystal;

injection means for causing a gas to come in contact with said liquid crystal; and

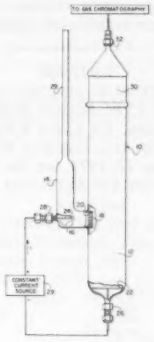
output means, connected to said detector means, for recording the intensity of reflected light detected by said detecting means.

3,927,978
ELECTROLYTIC STRIPPING CELL AND METHOD

Stanley P. Wasik, Rockville, Md., assignor to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Filed Nov. 20, 1974, Ser. No. 525,430
Int. Cl.² B01D *15/08*; G01N *27/28, 31/08, 33/18*
U.S. Cl. 23—230 R **7 Claims**

1. A method for stripping hydrocarbons from an aqueous liquid phase, comprising passing hydrogen bubbles upwardly through the liquid phase, collecting the hydrogen and stripped hydrocarbons in a head space region above the liquid phase,

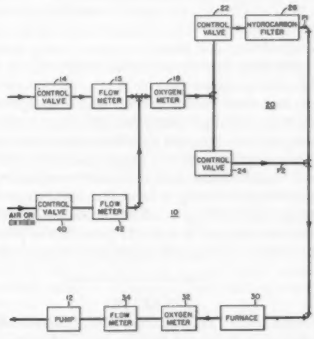


and analyzing a portion of the gas phase to determine the hydrocarbon concentration therein.

3,927,979
TECHNIQUE FOR MEASURING THE CARBON MONOXIDE AND REACTIVE HYDROCARBON CONTENT OF A GAS

Francis P. Byrne, Murrysville, and Thomas D. Kaczmarek, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 10, 1974, Ser. No. 478,139
Int. Cl.² G01N *31/12*
U.S. Cl. 23—232 R **4 Claims**



1. A combustion technique for determining the carbon monoxide and the smog and air pollutant reactive hydrocarbon content of a gas comprising the steps of;

stoichiometrically reacting oxygen with the total combustibles content of a first sample of the gas,

removing the smog and air pollutant reactive hydrocarbon content of a second sample of the gas,

stoichiometrically reacting oxygen with the carbon monoxide content of said second sample of the gas following removal of the smog and air pollutant reactive hydrocarbon content, the oxygen required to produce said stoichiometric reaction representing the amount of oxygen required to change the carbon monoxide to carbon diox-

ide, said amount of oxygen being indicative of the carbon monoxide content of the gas ,and,

determining the difference between the amount of oxygen required to stoichiometrically react with the carbon monoxide and the amount of oxygen required to stoichiometrically react with the total combustibles content of the gas, said difference being indicative of the smog and air pollutant reactive hydrocarbon content of the gas.

3,927,980

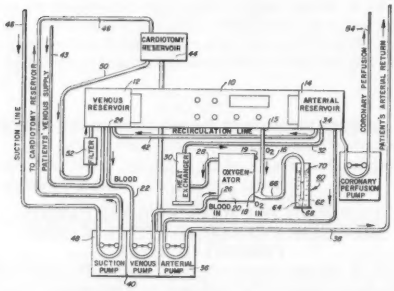
OXYGEN OVERPRESSURE PROTECTION SYSTEM FOR MEMBRANE-TYPE BLOOD OXYGENATORS

Ronald James Leonard, Elk Grove Village, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Aug. 22, 1973, Ser. No. 390,567

Int. Cl.[2] A61M *1/03*

U.S. Cl. 23—258.5 **6 Claims**



1. In an extracorporeal oxygenator system wherein oxygen and carbon dioxide are transferred across a porous, hydrophobic membranous barrier separating the blood and the oxygen, said oxygenator having a blood inlet, a blood outlet, and ar oxygen inlet and outlet; the improvement comprising, in combination: a blood reservoir coupled to said blood outlet downstream therefrom, said blood reservoir being positioned at a higher level than said blood outlet to provide to blood adjacent the membranous barrier a pre-determined minimum pressure; and manometer means which comprises an open liquid container being at least partially filled with a liquid; an oxygen supply line coupled to said oxygen inlet, venting conduit means coupled with said oxygen line and communicating with said liquid within said container and having an outlet therein, said liquid having a level that is selected to provide a pressure at said venting conduit means outlet but to permit venting of the oxygen in order to prevent the pressure of the oxygen from exceeding said minimum pressure of said blood.

3,927,981

MEMBRANE-TYPE BLOOD OXYGENATOR WITH RECYCLE OF OXYGEN-CONTAINING GAS

Stéphane Viannay, Plaisir, and André Sausse, Sceaux, both of France, assignors to Rhone Poulenc, Paris, France

Filed Aug. 30, 1973, Ser. No. 393,228

Claims priority, application France, Aug. 30, 1972, 72.30810

Int. Cl.[2] A61M *1/03*

U.S. Cl. 23—258.5 **7 Claims**

1. A blood oxygenator comprising, in combination:

a. a blood oxygenator chamber;

b. at least one gas-permeable membrane dividing said blood oxygenator chamber into a first compartment and a second compartment;

c. blood inlet and outlet means for connecting said first compartment into a blood stream;

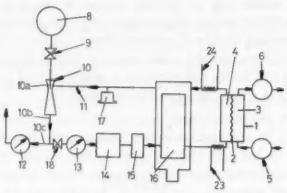
d. an inlet and outlet means connected to said second compartment;

e. a source of oxygen-containing gas under pressure;

f. a gas ejector;

g. a pressure nozzle of said gas ejector connected to said source of oxygen-containing gas;

h. means connecting a suction means connection of said gas ejector to said outlet means of said second compartment;



i. means connecting an exhaust means connection of said gas ejector to said inlet means of said second compartment, effective to recycle a portion of the gas which leaves said second compartment via said outlet means; and

j. means connecting an exhaust outlet means to said exhaust means connection to release the remainder of the gas flowing out through said exhaust means connection.

3,927,982

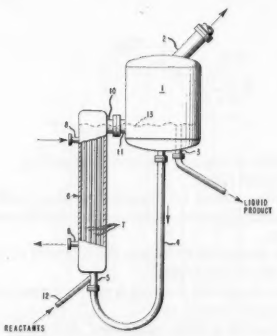
RECIRCULATING APPARATUS FOR CONTINUOUS ESTERIFICATION REACTIONS

Rodney M. Chapman, Kinston, N.C., and Kenneth A. Temple, Richmond, Va., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Division of Ser. No. 20,704, March 18, 1970, abandoned. This application June 19, 1973, Ser. No. 371,502

Int. Cl.[2] C07C *69/76*; B01J *8/12*, *8/00*

U.S. Cl. 23—260 **1 Claim**



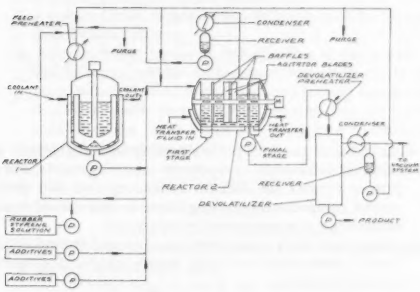
1. A chemical process apparatus, which is self-stirring and provides vigorous agitation of reacting materials without the use of mechanical stirring or pumping, comprising an esterification vessel for esterification liquid, a heat exchanger for heating the liquid to a temperature of 250° to 400°C. located externally of said esterification vessel, a conduit loop for conducting liquid without the use of a pump downward from the bottom of the vessel and then upward into the heat exchanger through a lower fluid inlet, means for injecting reactant feed mixture into the lower fluid inlet of the heat exchanger at a level at least 3 feet above the lowest point of the conduit loop, means for conducting heated fluid from the heat exchanger through an upper fluid outlet and into a vessel through an inlet in the side of the vessel, means in the upper

part of the vessel for withdrawing vapors, and overflow means in the vessel for withdrawing esterification product at a rate which maintains a constant liquid level within the vessel, said overflow means being located within said vessel at substantially the same height as said inlet in the side of said vessel, thereby ensuring sufficient liquid head within said vessel to maintain flow in said conduit loop.

3,927,983
CONTINUOUS STAGED ISOBARIC STIRRED POLYMERIZATION APPARATUS

Robert E. Gordon, Monson; Robert W. Jones, Wilbraham; Rajendra Paul, Agawam, and Robert H. M. Simon, Longmeadow, all of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 19, 1973, Ser. No. 398,722
Int. Cl.² B01J *1/00;* **C08L** *9/06*
U.S. Cl. 23—260 **25 Claims**



1. A continuous staged, isobaric, stirred reactor apparatus for operation in a generally horizontal configuration at partial fillage levels with evaporative cooling and for the continuous exothermic polymerization of monomers in a fluid reaction media under substantially linear flow conditions, said apparatus comprising:

a. a generally cylindrical, enclosed vessel, for operation in a generally horizontal configuration with input and output ports at opposite end regions thereof,

b. at least one shaft extending generally longitudinally through said vessel for axial rotational movements relative thereto,

c. at least one baffle-like member, each such member (1) extending generally radially and transversely across the interior of said vessel, (2) partitioning said vessel internally into staged chambers, (3) being longitudinally fixed relative to said shaft means, (4) defining during operation of said apparatus, radial clearances with said vessel interior wall and between adjacent chambers defining a top aperture for passage of vapor and a bottom aperture for passage of polymerizing fluid,

d. agitator blade means mounted on said shaft means and positioned in each of said staged chambers to maintain polymerizing fluid partially filling said vessel in each of said chambers during operation of said apparatus in horizontal configuration in a generally uniform and homogeneous condition,

e. drive means, coupled with that shaft means to rotatably drive same during operation of said apparatus,

f. vapor removal means comprising a vapor outlet port, a condenser and a receiver interconnected with an upper portion of said vessel to remove vapors evolved from fluid in said vessel in each of said chambers during operation of said apparatus,

g. condition sensing means to measure temperature and pressure in at least one of said chambers during operation of said apparatus and to convert the so measured values into at least one condition signal representative thereof,

h. set point means to generate a signal representative of a predetermined temperature desired in a predetermined one of said chambers,

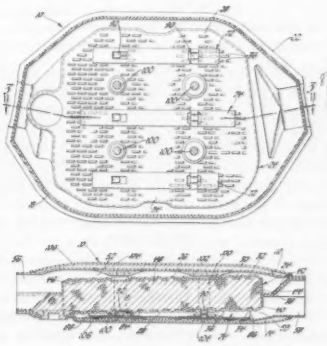
i. pressure control means interconnected with said vapor removal means, said condition sensing means, said set point means, a vent valve and a pressurized nitrogen valve regulating the pressure and the rate at which said condenser withdraws and condenses said vapors such that the temperature in at least one of said chambers is maintained with operating limits at a predetermined temperature and

j. flow regulating means interconnected with said input and output ports to maintain the average level of fluid in said vessel in each of said stated chambers within predetermined limits.

3,927,984
CATALYTIC CONVERTER BED SUPPORT MEANS

Frederick J. Hartley, Waterford, Wis., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 7, 1973, Ser. No. 422,699
Int. Cl.² F01N *3/15*
U.S. Cl. 23—288 F **4 Claims**

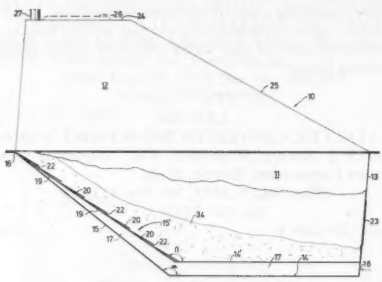


1. In a low profile catalytic converter assembly for the treatment of exhaust gas of the type having dished top and bottom housing plates with side wall portions and peripheral flange portions extending outwardly therefrom, a dished catalyst retaining element including top and bottom catalyst retaining plates with peripheral flange portions extending between the flange portions of said top and bottom housing plates for support of said retaining element, an exhaust gas inlet at one end of said assembly and an exhaust gas outlet at the other end of said assembly formed between said peripheral flange portions, a compact bed of catalytic material filling said dished catalyst retaining element in the space between said top and bottom catalyst retaining plates, said retaining plates sloping relative to said housing plates so that the flow area between the upper housing plate and the upper retaining plate decreases as the flow distance from said inlet to said outlet decreases, support studs extending between said top and bottom housing plates and through said top and bottom retaining plates and being anchored to the top and bottom housing plates, the improvement comprising a plurality of elongated channel supports secured to said bottom catalyst retaining plate and extending adjacent to said bottom housing plate, said supports having a flat surface portion extending in parallelism with said bottom housing plate with upstanding rib portions extending from said flat surface toward the bottom catalyst retaining plate between rows of perforations therein and with upstanding web portions forming tabs adapted to attach to said bottom housing plate thus defining open-ended channel means for the passage of exhaust gas therethrough without substantial impedance to the flow.

3,927,985
DEVICE FOR PREPARATION OF EARTH IMPROVING SUBSTANCES FROM ORGANIC WASTE

Roy Lennart Hyttinge, Huddinge; Lars Olov Widvall, Vallingby, and Anders Erik Ingvar Hook, Vallentuna, all of Sweden, assignors to Toa-Throne AB, Bromma, Sweden

Filed July 29, 1974, Ser. No. 492,470
Claims priority, application Sweden, Aug. 7, 1973, 7310836
Int. Cl.² C05F *3/04*; A47K *11/02*
U.S. Cl. 23—259.1 **4 Claims**



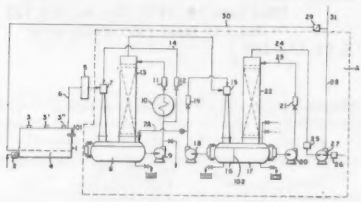
1. Receptacle for the production of earth improving substance from organic waste, comprising an inverted top section and a bottom section, said sections having congruent trapezoidal vertical cross sections and the top section being turned 180° in the horizontal plane relative to the bottom section and detachably mounted upon the bottom section to form a lid therefor, the dimensions of one of said sections being smaller than those of the other section in order to house the major part of said one section within said other tray for transportation when inverted and turned 180°, an inner bottom within said bottom section having an inclined portion and defining an air space therebelow, at least part of said inclined portion being of staircase shape with oblique steps formed by plates with slots and spacers between adjacent steps, whereby adjacent plates partly overlap each other to prevent waste from penetrating said slots, air inlet means communicating with said air space and through said slots with the waste receiving interior of said receptacle, and air outlet means for leading air out of said interior.

3,927,986
APPARATUS FOR INCINERATING A PLASTIC WASTE

Toshikatsu Ishikawa, Tokyo; Tei Endo, Yokohama; Toshio Masuyama, Yokohama; Fumio Uruma, Yokohama; Masutaka Morishita, Yokohama, and Takeshi Kuki, Tokyo, all of Japan, assignors to Nippon Carbon Co. Ltd., Tokyo, Japan

Filed Mar. 7, 1973, Ser. No. 339,018
Claims priority, application Japan, Mar. 9, 1972, 47-27947; Mar. 21, 1972, 47-28260; Oct. 19, 1972, 47-104633
Int. Cl.² B01J *1/00*; F23G *7/00*
U.S. Cl. 23—277 R **9 Claims**

1. An apparatus for incinerating solid plastic waste, comprising:
   1. an incinerator having inlet means for an oxidizing gaseous mixture, an outlet for exhaust gas and temperature sensing means for sensing the temperature within the incinerator, said incinerator also having an inlet for permitting solid plastic waste to be deposited therein,
   2. first detrimental components removing means connected to said outlet for exhaust gas and comprising
      a. a jet scrubber for sucking, cooling and washing said exhaust gas by a circulating liquid,
      b. an absorbing tower for absorbing hydrogen chloride contained in the exhaust gas cleaned by said jet scrubber,
      c. a reservoir tank for storing therein the circulating liquid for said jet scrubber and said absorbing tower, said reservoir tank being connected between said jet scrubber and said tower for permitting said exhaust gas to pass from said jet scrubber through the reservoir tank into said absorbing tower,
      d. means for introducing said circulating liquid into said jet scrubber and,
      e. means for cooling said circulating liquid and introducing it into said absorbing tower,
   3. second detrimental components removing means connected for receiving treated exhaust gas from said first detrimental components removing means and comprising a circulating liquid pump and an absorbing tower,

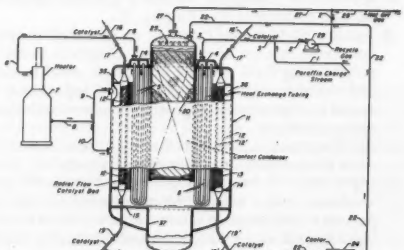


   4. an exhaust gas duct for connecting said incinerator to said first detrimental components removing means, and a further exhaust gas duct for connecting said first detrimental components removing means to said second detrimental components removing means,
   5. exhaust gas duct means connected to said second detrimental components removing means for discharging the exhaust gas, and
   6. control means responsive to said temperature sensing means and connected to both said inlet means and said exhaust gas duct means for supplying controlled quantities of exhaust gas and air to said incinerator to maintain the temperature within said incinerator to a maximum of about 800°C, said exhaust gas and air comprising an oxidizing gaseous mixture for controlling burning within the incinerator.

3,927,987
DEHYDROGENATION REACTOR

George R. Winter, III, Des Plaines, and William G. Boney, Rolling Meadows, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 451,660, March 14, 1974, which is a continuation-in-part of Ser. No. 301,007, Oct. 26, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,397
Int. Cl.² B01J *8/02*; C10G *35/04*
U.S. Cl. 23—288 K **4 Claims**



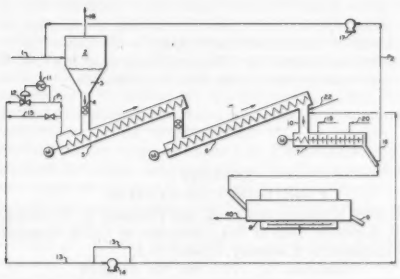
1. A reactor for the catalytic conversion of hydrocarbons which comprises:

a. a vertically oriented outer cylindrical vessel;
b. a first vertically orientated catalyst retaining screen, located within the outer vessel a distance redially inward from the inner surface of the outer vessel and defining an annular reactant distribution volume between the first catalyst retaining screen and the outer vessel;
c. a second vertically orientated catalyst retaining screen located within the first catalyst retaining screen a distance radially inward from the first catalyst retaining screen and defining an annular catalyst retention volume between the first and the second catalyst retaining screens;
d. an indirect heat exchange means arranged as a vertically orientated substantially hollow cylinder having a cylindrical central void volume and located adjacent to the second catalyst retaining screen, at a distance radially inward from the second catalyst retaining screen;
e. a contact condensing means located within the central void volume of the indirect heat exchange means, said condensing means comprising cylindrical packed bed of a vapor-liquid contacting media;
f. a reactant inlet means communicating with the reactant distribution volume;
g. a vapor outlet means communicating directly with the central void volume of the heat exchange means at a point located above the contact condensing means; and,
h. a liquid outlet means communicating with the internal volume of the outer vessel at a point located below the contact condensing means.

3,927,988
PELLETING CARBON BLACK

Arthur E. Frazier, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 8, 1973, Ser. No. 386,577
Int. Cl.² C01B *31/14*; B01J *2/12*
U.S. Cl. 23—314 **7 Claims**

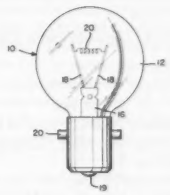


1. A method of pelleting carbon black which comprises:
a. introducing a first mixture comprising carbon black and occluded gases into a screw conveyor;
b. separating and withdrawing occluded gases having carbon black entrained therewith from said mixture at the inlet to said screw conveyor and leaving carbon black to be transferred by the screw conveyor;
c. transferring said carbon black remaining by said screw conveyor to a pelleter;
d. admixing the separated and withdrawn occluded gas and the entrained carbon black with the carbon black transferred by the screw conveyor downstream of said screw conveyor and thereafter introducing the resulting admixture into said pelleter; and
e. forming pellets out of said carbon black in said pelleter.

3,927,989
TUNGSTEN ALLOY FILAMENTS FOR LAMPS AND METHOD OF MAKING

Ronald C. Koo, Weehawken, N.J., assignor to Duro-Test Corporation, North Bergen, N.J.

Continuation-in-part of Ser. No. 862,340, Sept. 30, 1969, abandoned. This application Jan. 31, 1973, Ser. No. 328,246
Int. Cl.² B22F *1/00, 5/00*
U.S. Cl. 29—182.5 **20 Claims**



1. In a tungsten filament of the type containing a filament dopant compound including at least one alkali metal which produces a second phase consisting of bubbles at filament operating temperatures to improve the sag resistant properties of the filament, the improvement comprising a third phase material selected from the group consisting of titanium, zirconium, hafnium, tantalum, ruthenium, strontium and columbium added to the filament for combining with the bubbles to reduce their migration and coalescence.

3,927,990
TWO-PART SINTERED ELECTRICAL CONTACT

Bernhard Rothkegel, and Horst Schreiner, both of Nuremberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Feb. 5, 1971, Ser. No. 112,979
Claims priority, application Germany, Feb. 7, 1970, 2005681
Int. Cl.² B22D *19/00*
U.S. Cl. 29—191 **23 Claims**

1. A contact member for high electrical loads comprising at least two component parts, the second part being a carrier portion of sintered porous solderable material and good electrically conductive properties, and the first part being a contact layer of sintered porous non weldable material resistant to burn off, the sintered component parts being impregnated by the same impregnating metal which firmly connects the sintered parts together with a continuous concentration of the impregnating metal in the sintered parts.

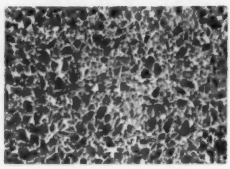
3,927,991
WEAR-RESISTANT SLIDING MEMBER

Jun Miyata; Toshihumi Morimoto, both of Hiroshima, and Hiroshi Yamazoe, Yokohama, all of Japan, assignors to Toyo Kogyo Co., Ltd. and Nippon Carbon Co. Ltd., both of, Japan

Continuation of Ser. No. 53,569, July 9, 1970, abandoned. This application Nov. 20, 1972, Ser. No. 308,276
Claims priority, application Japan, July 15, 1969, 44-56278
Int. Cl.² B32B *15/20*
U.S. Cl. 29—191.2 **3 Claims**

1. An apex seal member of a rotary piston engine having a continuous structure comprising a member selected from the group consisting of aluminum and an aluminum alloy and carbon particles, essentially uniformly distributed in said aluminum or aluminum alloy, said structure being prepared from a composition in which the amount of said carbon particles is by volume 40 to 80% of said member; and the size of the carbon particles is finer than 100 mesh Tyler standard and a

layer of aluminum carbide formed in the interface between said aluminum or aluminum alloy and the surface of each of



said carbon particles to securely bond said carbon particles thereto.

3,927,992

COAL COMBUSTION PROCESS AND COMPOSITION

Robert V. Kerley, Ortonville, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 878,258, Nov. 19, 1969, abandoned, which is a continuation of Ser. No. 723,945, April 24, 1968, abandoned, which is a continuation of Ser. No. 601,558, Dec. 14, 1966, abandoned. This application Nov. 23, 1971, Ser. No. 201,301

Int. Cl.² C10L *9/00, 10/00*

U.S. Cl. 44—4 **10 Claims**

1. A process for reducing the sulfur trioxide produced in the combustion of coal, said process consisting essentially of burning pulverized coal in a combustion chamber in the presence of a combustion improving quantity of (methyl cyclopentadienyl)manganese tricarbonyl, wherein said coal and said (methylcyclopentadienyl) manganese tricarbonyl are simultaneously but separately introduced into said combustion chamber.

3,927,993

FIRE STARTER AND METHOD

Ronald W. Griffin, 2047 E. Fifth, Albany, Oreg. 97321

Filed Nov. 21, 1973, Ser. No. 418,044

Int. Cl.² C10L *11/00*

U.S. Cl. 44—39 **25 Claims**

1. A fire starter comprising particles of metallic sponge material from the group consisting of zirconium, titanium and hafnium bonded together into a compact mass in combination with ignition means associated with said mass for igniting said sponge material.

25. The method of starting a fire comprising compacting particles of metallic sponge selected from the group zirconium, titanium and hafnium under sufficient pressure to bond mechanically said particles into a dense mass, igniting the particles of said mass to cause them to burn for an extended period of time by applying sufficient external detonating pressure to said compacted mass to raise the temperature thereof to its spontaneous combustion temperature, and applying said ignited particles of said metallic sponge to a material to be burned.

3,927,994

ADDITIVE COMPOSITION FOR SPARK-IGNITION ENGINE FUELS

Duane R. Romans, Kansas City, Mo., assignor to Farmland Industries, Inc., Kansas City, Mo.

Filed Dec. 26, 1973, Ser. No. 428,138

Int. Cl.² C10L *1/20*

U.S. Cl. 44—63 **3 Claims**

1. In combination:

a quantity of spark ignition fuel;

an additive admixed with said fuel and taken from the group consisting of:

A. from about 20 to 200 ppm, based upon the fuel, of dodecylphenol ethoxylate containing an average of about 5 radicals of the formula $-O-C_2H_3-CH_2-$, and from about 10 to 100 ppm, based upon the fuel, of 1-(2-hydroxyethyl)-2-uncosyl-2-imidazoline;

B. from about 20 to 200 ppm, based upon the fuel, of dodecylphenol ethoxylate containing an average of about 7 radicals of the formula $-O-CH_2-CH_2-$, and from about 10 to 100 ppm, based upon the fuel, of 1-(2-hydroxyethyl)-2-uncosyl-2-imidazoline; and

C. from about 20 to 200 ppm, based upon the fuel, of dodecylphenol ethyoxylate containing an average of about 7 radicals of the formula $-O-CH_2-CH_2-$, and from about 10 to 100 ppm, based upon the fuel, of 1-(2-aminoethyl)-2-tridecyl-2-imidazoline.

3,927,995

ADDITIVE COMPOSITION FOR COMPRESSION-IGNITION ENGINE FUELS

Duane R. Romans, Kansas City, Mo., assignor to Farmland Industries, Inc., Kansas City, Mo.

Filed Oct. 23, 1973, Ser. No. 408,425

Int. Cl.² C10L *1/20*

U.S. Cl. 44—63 **3 Claims**

1. In combination:

a quantity of compression ignition fuel;

an additive admixed with said fuel and taken from the group consisting of:

A. from about 20 to 300 ppm, based upon the fuel, of nonylphenol ethoxylate containing an average of about 4 radicals of the formula $-O-CH_2-CH_2-$, and from about 1 to 100 ppm, based upon the fuel of 1-(2-hydroxyethyl)-2-heptadecenyl-2-imidazoline;

B. from about 20 to 300 ppm, based upon the fuel, of dodecylphenol ethoxylate containing an average of about 5 radicals of the formula $-O-CH_2-CH_2-$, and from about 1 to 100 ppm, based upon the fuel, of 1-(2-hydroxyethyl)-2-heptadecenyl-2-imidazoline; and

C. from about 20 to 300 ppm, based upon the fuel, of dodecylphenol ethoxylate containing an average of about 5 radicals of the formula $-O-CH_2-CH_2-$, and from about 1 to 100 ppm, based upon the fuel, of 1-(2-hydroxyethyl)-2-uncosyl-2-imidazoline.

3,927,996

COAL INJECTION SYSTEM

Christian W. Knudsen, Seabrook, and Hermann E. von Rosenberg, Baytown, both of Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 21, 1974, Ser. No. 444,614

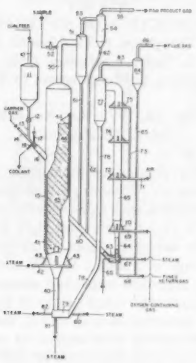
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C10J *3/06*

U.S. Cl. 48—197 R **10 Claims**

1. In a process wherein finely divided carbonaceous solids which contain volatilizable hydrocarbon constituents and have an initial softening point and a resolidification point higher than said initial softening point are introduced into a fluidized bed of char particles maintained at a temperature above said resolidification point for devolatilization and wherein gases containing entrained fines are withdrawn overhead from said fluidized bed, the improvement which comprises entraining said carbonaceous solids in a preheated stream of carrier gas having a temperature in excess of about 300° F. but below said initial softening point, injecting said stream of carrier gas containing the entrained solids into said fluidized bed through a fluid-cooled nozzle at a superficial gas velocity between about 15 and 1,000 feet per second, monitoring the entrained fines content of said gases withdrawn overhead from said fluidized bed, and regulating the velocity

at which said carrier gas and entrained carbonaceous solids are injected into the bed through said nozzle in response to



changes in said entrained fines content of said gases to produce controlled attrition of agglomerated particles in said bed.

3,927,997

METHANE-RICH GAS PROCESS

Edward T. Child, Tarrytown, N.Y., and Allen M. Robin, Anaheim, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,467
Int. Cl.² C10J *3/06*
U.S. Cl. 48—197 R **16 Claims**

1. A process for producing a methane-rich gas stream comprising the steps of (1) reacting a hydrocarbonaceous fuel with substantially pure oxygen comprising 95 mole % 0_2 or more by partial oxidation in the presence of a temperature moderator selected from the group consisting of H_2O, CO_2, and mixtures thereof in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator, at an autogenous temperature in the range of about 1700 to 3100°F., and a pressure in the range of about 1 to 250 atmospheres gauge wherein the weight ratio of H_2O/hydrocarbonaceous fuel is in the range of 0.5 to 5.0, the atomic ratio of oxygen in the substantially pure oxygen to carbon in the hydrocarbonaceous fuel is in the range of about 0.8 to 1.0, and the stream of effluent gas leaving said synthesis gas generator comprises mixtures of H_2 and more than 10 mole % CO having a mole ratio H_2/CO in the range of greater than 1.0 to no greater than 3.0, H_2O, CH_4, CO_2, particulate carbon, and gaseous impurities selected from the group consisting of COS, H_2S, Ar, N_2, and mixtures thereof; (2) cooling the process gas stream from (1), and removing particulate carbon, H_2O, at least a portion of said CO_2, and said gaseous impurities therefrom; (3) adjusting the mole % CO_2 in the clean process gas stream from (2) to a value in the range of about 0.5 to 20 and a mole ratio H_2/CO_2 in the range of about 2 to 60, and a temperature in the range of about 390°F to 1000°F; (4) introducing the process gas stream from (3) without a separate water-gas shift step into a catalytic methanation zone where said H_2 and CO are reacted together while in contact with a methanation catalyst at a pressure in the range of about 1 to 250 atm. to produce an effluent gas stream comprising CH_4 and containing one or more members of the group consisting of CO, H_2, H_2O, and CO_2; and (5) cooling and separating one or more of said members from the effluent gas stream from (4), producing said methane-rich gas stream having a gross heating value of 940 BTU/SCF or more.

3,927,998

PRODUCTION OF METHANE-RICH GAS STREAM

Edward T. Child, Tarrytown, N.Y.; Allen M. Robin, Anaheim, Calif.; William L. Slater, La Habra, Calif., and George N. Richter, San Marino, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,468
Int. Cl.² C10J *3/06*
U.S. Cl. 48—197 R **11 Claims**

1. A process for producing a methanerich gas stream comprising the steps of

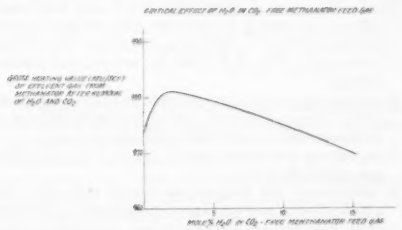
1. reacting a hydrocarbonaceous fuel feed by partial oxidation with substantially pure oxygen comprising 99 mole % O_2 or more and H_2O at an autogeneous temperature in the range of about 1700° to 3100°F and a pressure in the range of about 1 to 250 atmospheres in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator, wherein the weight ratio of H_2O/hydrocarbonaceous fuel is in the range of 2.2–2.9 and the atomic ratio of oxygen in the substantially pure oxygen to carbon in the fuel is in the range of 0.80–0.84, and the stream of effluent gas leaving said synthesis gas generator principally comprises mixtures of H_2 and CO having a mole ratio H_2/CO in the range of 1.0 to 2.5, CH_4 in the amount of 15 mole % or more, H_2O, CO_2, and one or more members of the groups COS, H_2S, Ar and N_2, and wherein said effluent gas stream contains 13 weight % or less of particulate carbon (basis weight of C in said hydrocarbonaceous fuel feed);
2. cooling the process gas stream from (1) and separating particulate carbon, H_2O, CO_2 and one or more members of the group COS, H_2S, Ar, and N_2; and
3. introducing the dry process gas stream from (2) without a separate water-gas shift step into a catalytic methanation zone where said H_2 and CO are reacted together at a temperature in the range of about 390° to 1400°F. and at a pressure in the range of about 1 to 250 atmospheres to produce a methane-rich gas stream principally comprising CH_4 and containing H_2O, CO_2, and one or more members of the group H_2, CO, Ar and N_2; and
4. Separating said H_2O and CO_2 from the methane-rich gas stream from (3) to produce a product gas stream comprising at least 93 mole % CH_4.

3,927,999

METHANE-RICH GAS PROCESS

Edward T. Child, Tarrytown, N.Y., and Allen M. Robin, Anaheim, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,469
Int. Cl.² C10J *3/06*
U.S. Cl. 48—197 R **14 Claims**



1. In a process for producing a methane-rich gas stream by the partial oxidation of a hydrocarbonaceous fuel with a free-oxygen containing gas in the presence of a temperature moderator to produce a process gas stream which is subsequently subjected to catalytic methanation the improvement comprising the steps of (1) reacting said hydrocarbonaceous fuel feed by partial oxidation with substantially pure oxygen comprising at least 95 mole % O_2 and a temperature moderator selected

SNG Processes

from the group consisting of H_2O, CO_2, and mixtures thereof at an autogenous temperature in the range of about 1700° to 3100°F and a pressure in the range of about 1 to 250 atmospheres gauge in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator, wherein the weight ratio of H_2O/hydrocarbonaceous fuel is in the range of 0.2 to 3, the atomic ratio of oxygen in the substantially pure oxygen to carbon in the hydrocarbonaceous fuel is in the range of about 0.75 to 1.0 and the stream of effluent gas leaving said synthesis gas generator comprises mixtures of H_2 and CO having a mole ratio H_2/CO in the range of about 0.5 to 1.15, H_2O, CH_4, CO_2 and one or more members of the group of impurities COS, H_2S, Ar, and N_2, and particulate carbon; (2) cooling the process gas stream from (1); removing therefrom particulate carbon, CO_2, H_2S, COS and adjusting the mole % H_2O in the process gas stream to a value in the range of about 0.1 to 15; and adjusting the temperature to a value in the range of about 390° to 600°F.; (3) introducing the process gas stream from (2) into a catalytic methanation zone where said H_2 and CO are reacted together while in contact with a methanation catalyst at a pressure in the range of about 1 to 250 atm. to produce an effluent gas stream comprising CH_4 and containing one or more members of the group H_2O, H_2, CO_2, CO, N_2 and Ar; and (4) separating H_2O and CO_2 from the effluent gas stream from (3), producing said methane-rich gas stream comprising at least 70 mole % of methane (dry basis).

3,928,000

PRODUCTION OF A CLEAN METHANE-RICH FUEL GAS FROM HIGH-SULFUR CONTAINING HYDROCARBONACEOUS MATERIALS

Edward T. Child, Tarrytown, N.Y.; Allen M. Robin, Anaheim, Calif.; William L. Slater, La Habra, Calif., and George N. Richter, San Marino, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,470

Int. Cl.² C10J *3/06*

U.S. Cl. 48—197 R **23 Claims**

1. A process for producing a methane-rich gas from a sulfur-containing hydrocarbonaceous fuel comprising the steps of

1. reacting said sulfur-containing hydrocarbonaceous fuel feed by partial oxidation with substantially pure oxygen comprising 95 mole % O_2 or more and a temperature moderator from the group H_2O, CO_2, and mixtures thereof at an autogenous temperature in the range of about 1700° to 3100°F and a pressure in the range of about 1 to 250 atmospheres in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator, wherein the mole ratio of oxygen in the free-oxygen containing gas to carbon in the hydrocarbonaceous fuel is in the range of about 0.80 to 1.0, and the stream of effluent gas leaving the synthesis gas generator comprises mixtures of H_2, CO, H_2O, CO_2, and one or more members of the group CH_4, H_2S, COS, N_2, and Ar, and particulate carbon;
2. cooling the process gas stream from (1) to a temperature in the range of about 300° to 800°F by indirect heat exchange with water thereby producing steam;
3. separating particulate carbon and H_2O from the process gas stream from (2);
4. introducing the process gas stream from (3) without purification of said gas stream directly into a methanation zone containing a sulfur-resistant methanation catalyst comprising about 0.8 to 10 atoms of a first element selected from the group Mo, Cr, W or mixtures thereof per atom of a second element selected from the group CO, Ni or mixtures thereof, and reacting said H_2 and CO together at a temperature in the range of about 500 to 1500°F and at a pressure in the range of about 1 to 250 atmospheres to produce an effluent gas stream comprising mixtures of CH_4 and one or more members of the group H_2, CO, H_2O, CO_2, COS, H_2S, N_2 and Ar; and
5. cooling the effluent gas stream from (4) and removing therefrom one or more members of said group in a gas purification zone.

3,928,001

PRODUCTION OF METHANE

Edward T. Child, Tarrytown, N.Y.; Allen M. Robin, Anaheim, Calif.; William L. Slater, La Habra, Calif., and George N. Richter, San Marino, Calif., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 28, 1973, Ser. No. 429,471

Int. Cl.² C10J *3/06*

U.S. Cl. 48—197 R **12 Claims**

1. A process for producing substantially pure methane comprising the steps of (1) reacting a hydrocarbonaceous fuel feed by partial oxidation with substantially pure oxygen comprising 95 mole % O_2 or more and H_2O at an autogenous temperature in the range of about 1700° to 3100°F. and a pressure in the range of about 1 to 250 atmospheres in the reaction zone of a free-flow unpacked noncatalytic synthesis gas generator, wherein the weight ratio of H_2O/ hydrocarbonaceous fuel is in the range of 0.25 to 1.7, the atomic ratio of oxygen in the substantially pure oxygen to carbon in the hydrocarbonaceous fuel is in the range of 0.85 to 1.0, and the stream of effluent gas leaving said synthesis gas generator principally comprises mixtures of H_2 and CO having a mole ratio H_2/CO in the range of 1.0 to below 1.5, H_2O, CO_2, and one or more members of the group CH_4,COS, H_2S, Ar, and N_2 and particulate carbon; (2) cooling the process gas stream from (1) and separating particulate carbon, H_2O, CO_2, H_2S, and COS therefrom, thereby producing a stream of dry feedgas; (3) introducing the stream of dry feedgas from (2) without a separate water-gas shift step into a catalytic methanation zone where H_2 and CO are reacted together at a temperature in the range of about 390° to 1000°F. and at a pressure in the range of about 1 to 250 atmospheres to produce a methane-rich gas stream principally comprising CH_4 and containing H_2O, CO_2 and one or more members of the group H_2, CO, Ar, and N_2; and (4) separating said H_2O and CO_2 from the methane-rich gas stream from (3), producing a product gas stream comprising about 90 or more mole % CH_4 and having a gross heating value of 920 BTU/SCF or more.

3,928,002

LOW-TEMPERATURE STEAM REFORMING PROCESS FOR HYDROCARBONS

Kiyoshi Morikawa, Fujisawa; Akio Furuta, Yokohama, and Hideyuki Matsumoto, Tokyo, all of Japan, assignors to Japan Gasoline Co., Ltd. and Nikki Chemical Co., Ltd., both of Tokyo, Japan

Filed Nov. 21, 1973, Ser. No. 417,768

Claims priority, application Japan, Nov. 28, 1972, 47-118573

Int. Cl.² C01B *2/14*

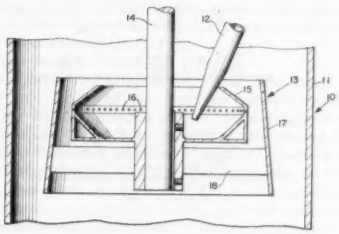
U.S. Cl. 48—214 **5 Claims**

1. In a process for manufacturing a gas containing more than 40 percent of methane on a dry basis, by subjecting steam-reformable feed hydrocarbon to adiabatic low-temperature steam reforming in the presence of a nickel catalyst, the improvement which comprises preheating a mixture of said feed hydrocarbon with steam mixed in the ratio of moles of steam to the number of moles of carbon atoms in said feed hydrocarbon in the range of 0.9 to 5.0 to a temperature in the range of 250° to 600°C, feeding the preheated mixture into a steam reforming reaction zone containing a binary catalyst consisting of Ni-MgO or Ni-NiO-MgO in which the atomic ratio of nickel to magnesium is in the range of 0.5 to 5.0, and effecting steam reforming of said feed hydrocarbon under a pressure in the reaction zone in the range of 10 to 100 Kg/cm² G, while maintaining the temperature of said catalyst in the range of 300° to 600°C.

3,928,003
VACUUM DEAERATOR FOR VISCOUS LIQUIDS

Durward Fryar, Burlington, Ky., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed June 22, 1973, Ser. No. 372,734
Int. Cl. B01d *19/00, 45/00*
U.S. Cl. 55—41 6 Claims

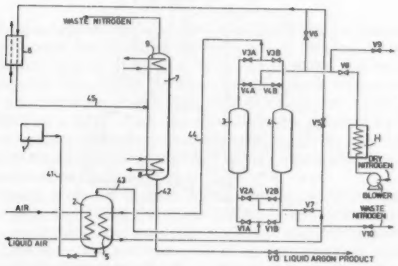


1. A centrifugal vacuum deaerator comprising an enclosed chamber connected to a source of vacuum for creating a vacuum within said chamber, and a rotor disposed within said chamber, said rotor comprising a flange positioned to receive the material to be deaerated after it is accelerated by centrifugal force, said flange being distinguished by being unperforated in the area where the material impinges, and said flange being further distinguished by the absence of any flow-impeding means which would substantially impede the spreading of said material into a thin film when it is deposited on said flange, and the presence of an edge on said flange over which said thin film of said material can be sheared by centrifugal force.

3,928,004
PURIFICATION OF INERT GASES

Bernard Ramsay Bligh, Hampton Hill, and John Allam, Guildford, both of England, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 7, 1974, Ser. No. 431,188
Claims priority, application United Kingdom, Jan. 8, 1973, 925/73
Int. Cl.² B01D *53/04*
U.S. Cl. 55—66 5 Claims

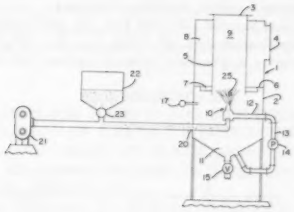


2. A process according to claim 1, wherein the cooling bed of molecular sieve is a columnar bed and the cold stream of the pure inert gas is passed therethrough so that particles of the molecular sieve in the bed are progressively and successively cooled in the direction in which the pure inert gas is passed through the bed to an extent which substantially prevents the said argon adsorption.

3,928,005
METHOD AND APPARATUS FOR TREATING GASEOUS POLLUTANTS IN A GAS STREAM

Dennis J. Laslo, Whitehall, Pa., assignor to Fuller Company, Catasauqua, Pa.

Filed Feb. 19, 1974, Ser. No. 443,589
Int. Cl.² B01D *53/14*
U.S. Cl. 55—73 6 Claims

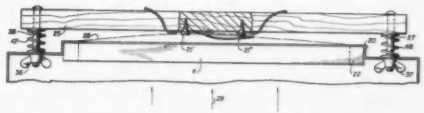


1. Apparatus for treating gaseous pollutants in a gas stream comprising:
- a vessel having an inlet for a dirty gas stream containing gaseous pollutants and an outlet for cleaned gas;
- means dividing said vessel into a dirty gas chamber and a cleaned gas chamber;
- nozzle means mounted in said vessel;
- means for supplying a scrubbing liquid to said nozzle means; means for supplying a compressed gas to said nozzle means for atomizing said scrubbing liquid whereby said nozzle means directs the atomized liquid into the flow of dirty gas; and
- means for supplying a material to said means for supplying a compressed gas to said nozzle means whereby the material is conveyed to said nozzle means and is discharged from the nozzle means into the flow of dirty gas for treating gaseous pollutants from said gas stream.

3,928,006
DEVICE FOR SIGNALLING DIRTY FILTERS

Richard P. Martineau, 429 Elm St., Keene, N.H. 03431

Filed Aug. 29, 1974, Ser. No. 501,610
Int. Cl.² B01D *35/14*; G08B *21/00*
U.S. Cl. 55—274 1 Claim



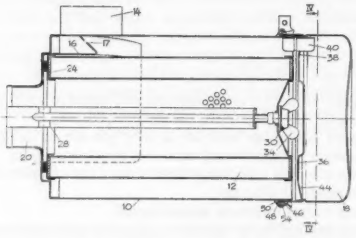
1. A signalling device for automatically designating the end of useful filter life in a circulating air system such as a furnace, comprising in combination,
- a circulating air passageway,
- a blower forcing a flow of air through said passageway,
- a substantially planar filter arranged in said passageway to intercept the flow of said air,
- rigid peripheral mounting structure for said filter confining it in place at the edges and permitting the unsupported central portion of said filter to flex in the direction of air flow therethrough,
- and means including a switch for signalling end of life positioned for actuation by the crown of the bowing movement of said central portion after it is flexed a predetermined distance as a result of increased resistance to air flow when it has become partially clogged by retention of dust and the like.

said switch having a mounting structure supporting said switch adjacent said filter mounting structure and having adjusting means thereon for establishing said predetermined distance for relatively positioning said two mounting structures.

3,928,007
DRY-TYPE AIR FILTERS

Neville Jackson, Hinckley, England, assignor to Burgess Products Company Limited, Hinckley, England

Continuation of Ser. No. 334,130, Feb. 20, 1973, abandoned. This application Nov. 27, 1974, Ser. No. 527,700
Claims priority, application United Kingdom, Feb. 22, 1972, 8223/72
Int. Cl.² B01D *50/00*
U.S. Cl. 55—337 **3 Claims**



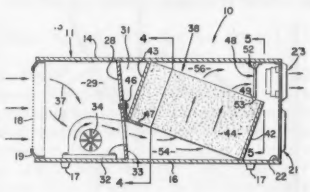
1. A dry-type air filter comprising means defining a cylindrical casing having a side wall, a cylindrical filter element, means mounting said filter element within said casing and being of relatively less diameter than said casing defining therewith an annular spacing therebetween, means defining the rearward end of said casing, means defining the forward end of said casing, said casing having a tangential dirty air inlet in its side wall proximate its rearward end, said casing also having a clean air outlet, the improvement comprising a shield disposed interiorly of said casing within said spacing, between said filter element and said dirty air inlet protecting said filter element from direct impact by dirty air from said inlet, said shield being arcuate in cross section and of reduced peripheral extent with relation to said filter element extending about only a portion thereof, said shield having a forward end edge, a rearward end edge, and first and second side edges, said forward end edge terminating a limited distance forwardly of said opening, said rearward end edge terminating proximate said casing rearward end, said first side edge being relatively remote from said inlet, said shield second side edge being relatively proximate said inlet, an out-turned ramp integrally formed on the proximate second side edge of said shield and extending across said spacing, otherwise said shield throughout its extent is spaced from said casing side wall.

3,928,008
FILTERING APPARATUS

Petersen, Ross K., 2974 W. River Road, Minneapolis, Minn. 55406

Filed Aug. 5, 1974, Ser. No. 494,539
Int. Cl.² B01D *46/00*
U.S. Cl. 55—472 **20 Claims**

17. An apparatus for separating foreign materials from a pneumatic fluid comprising: side walls and top and bottom walls forming a housing having a generally rectangular filtering chamber with passage means having a generally longitudinal axis for carrying pneumatic fluid, a transverse member closing one end of the filtering chamber and having an inlet opening to said filtering chamber, means mounted on the housing located adjacent said inlet opening for moving fluid through the passage means, an outlet from said chamber at the other end of the filtering chamber spaced from the inlet opening, filtering means located in the filtering chamber for separating foreign materials from the fluid moving through the passage, said filtering means having a box-shaped frame and filtering media located within and across said frame, means in the filtering chamber connected to the transverse member for supporting one end wall of said frame in an elevated position relative to the longitudinal axis of the passage means with an upper end of said end wall in engagement with the top wall of

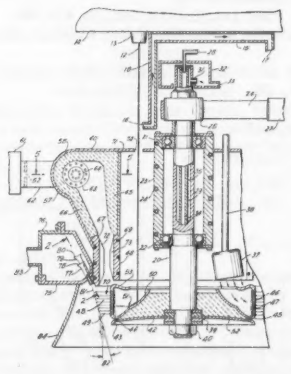


the housing, and the bottom wall of the housing supporting the other end wall of said frame to support said frame in an inclined position diagonally dividing the filtering chamber into an inlet plenum space open to the inlet opening and the entire inlet side of the filtering means, and an outlet plenum space open to the outlet from said chamber and the entire outlet side of the filtering means, and holding means cooperating with the housing in the filtering means to hold the filtering means in its inclined position in the housing.

3,928,009
ROTARY FORMING UNIT FOR FINE MINERAL FIBERS

Walter Merton Perry, 76 Locust Hill Road, Darien, Conn. 06820

Continuation-in-part of Ser. No. 231,347, March 3, 1972, Pat. No. 3,785,791. This application Oct. 15, 1973, Ser. No. 406,360
Int. Cl.² C03D *37/04*
U.S. Cl. 65—14 **17 Claims**



1. In an apparatus for forming fine fibers from heat softened viscous thermoplastic mineral material, such as glass, said apparatus comprising,

a hollow rotor, having a main flange wall which has connected thereto outer annular support means near its periphery, and having an outer peripheral wall attached to said annular support means, said outer peripheral wall having a plurality of superposed filament forming orifices therein, shaft means for supporting said rotor and with

said shaft means attached to said main flange wall of said rotor, and means for turning said rotor at high speed to effect discharge by centrifugal force of the softened mineral material thru the orifices in the form of filaments,

means for supplying said heat softened mineral material to the interior region of said rotor,

means for controlling the temperature of parts of said rotor, annular concentric orifice means positioned radially outward from the outer peripheral wall of said rotor, and having means for discharging gases from said orifice means into engagement with said filaments and to change the direction of their flow,

the improvement comprising

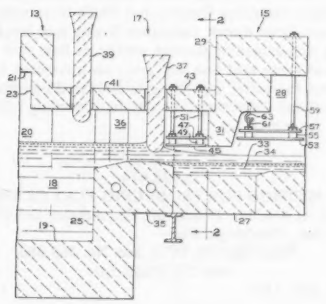
a hollow rotor structure, in which said main flange wall of said rotor and said outer annular support means connected thereto are made of base metal, and in which the main area of said outer peripheral wall of said rotor is made of corrosion resistant alloy material, and with said corrosion resistant alloy material consisting essentially of platinum group metals, and with a plurality of superposed filament forming orifices therein, and with said corrosion resistant alloy material welded to and reinforced by said outer annular support means of base metal.

3,928,010

METHOD AND APPARATUS FOR FORMING GLASS ON MOLTEN METAL BY USING A RADIATION REFLECTOR

Deane G. Cramer, Festus, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 30, 1974, Ser. No. 474,847
Int. Cl.² C03B *18/02*
U.S. Cl. 65—65 A **19 Claims**



1. In an apparatus for making glass comprising a glassmaking furnace for supplying molten glass, a forming chamber including a pool of molten metal for supporting glass and means for forming the glass into flat glass while supporting it on and conveying it along the molten metal, and means for delivering a layer of molten glass from the glassmaking furnace to the glass forming chamber and connecting a discharge end of the furnace to an inlet end of the forming chamber, the improvement comprising

means, mounted inside the glass forming chamber, spaced from and facing the upper surface of the pool of molten metal for facing the upper surface of a delivered layer of molten glass, and spaced from an overlying roof portion of the forming chamber, for directing heat received from the molten glass substantially immediately following its delivery onto the molten metal back to the glass, said means being located inside the chamber in a zone of the chamber adjacent its inlet end where a delivered layer of glass is supported and conveyed prior to reaching a stable thickness.

13. In a method of making glass comprising the steps of melting and refining glass, delivering a layer of molten glass onto a pool of molten metal, supporting it on and conveying it along the molten metal while cooling it to form a dimensionally stable continuous sheet of glass and thereafter withdrawing the continuous sheet of glass from the pool of molten metal, the improvement comprising

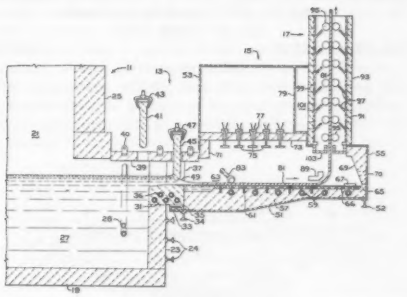
retarding sufficiently the loss of heat from the upper surface of the layer of molten glass substantially immediately following its delivery onto the molten metal and before the layer of molten glass reaches a stable thickness to maintain its viscosity within the range of from 10^3 to 10^5 poises to cause the continuous sheet of glass to have observably diminished optical distortion along the direction of its conveyance during forming.

3,928,011

APPARATUS AND METHOD FOR CONTROLLING THE ORIENTATION OF A NEWLY-FORMED CONTINUOUS SHEET OF FLAT GLASS

James R. Schornhorst, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 15, 1974, Ser. No. 514,968
Int. Cl.² C03B *18/02*
U.S. Cl. 65—65 A **15 Claims**



1. In an apparatus for making flat glass comprising and enclosed forming chamber having an upstream inlet end, a downstream outlet end, a bottom portion containing a pool of molten metal, a pair of sidewalls extending from the upstream end to the downstream end of the chamber and a roof portion providing a headspace above the pool of molten metal; means for delivering molten glass to the forming chamber at its upstream end and onto the pool of molten metal; means for advancing the glass along the surface of the pool of molten metal and for applying forces to it to form a continuous sheet of glass; means for sufficiently cooling the glass during its advance to cause the formed continuous sheet of glass to be dimensionally stable; means for lifting the formed continuous sheet of glass upwardly from the pool of molten metal; and means for conveying the lifted sheet of glass upwardly from the forming chamber, the improvement comprising:

means for individually adjusting the temperatures of the marginal edge portions of the dimensionally stable sheet of glass during lifting for controlling the alignment of the sheet of glass while conveying it upward wherein said temperature adjusting means includes at least one cooler on each side of the chamber in the headspace above the glass and having a cooling face facing the advancing glass on the pool of molten metal and a cooling face facing the upwardly conveyed glass, each cooling face being effective for removing sufficient heat from the glass to control the location at which the glass facing the cooling lifts from the molten metal.

11. In a method of making glass comprising the steps of delivering molten glass onto a pool of molten metal in a bottom portion of a forming chamber having an upstream end, sidewalls, a downstream end, and a roof portion enclosing a headspace above the pool of molten metal; advancing the

glass along the surface of the pool of molten metal toward the downstream end of the forming chamber; cooling the glass during its advance and applying forces thereto to form a continuous sheet of glass; thereafter lifting the sheet of glass upwardly from the pool of molten metal and conveying it upwardly thereform, te improvement comprising:

individually adjusting the temperature of the marginal edge portions of the sheet of glass during lifting to control the alignment of the sheet of glass while conveying it upwardly, wherein the temperatures of the marginal edge portions of the sheet of glass are adjusted to decrease the radius of curvature of the marginal edge portion of the glass sheet during lifting on the side of the sheet that is closest to a forming chamber sidewall.

3,928,012

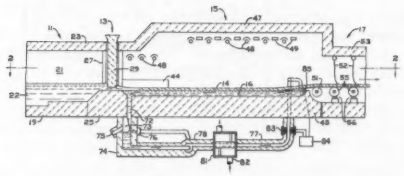
METHOD AND APPARATUS FOR REGULATING THE TEMPERATURE OF A GLASS SHEET FLOAT TANK

William C. Harrell, Sarver, and Homer R. Foster, Kittanning, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 338,496, March 6, 1973, Pat. No. 3,843,345. This application Oct. 21, 1974, Ser. No. 516,693. The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² C03B *18/02*

U.S. Cl. 65—65 A **20 Claims**



2. In a method of manufacturing flat glass wherein a layer of glass is advanced in a path from an upstream location to a downstream location along the surface of a pool of molten metal while the glass is cooled to form a continuous sheet of glass, the improvement comprising

removing a portion of the molten metal from the pool of molten metal at the upstream location,

regulating the temperature of the removed portion of molten metal, and

directing the temperature-regulated metal into the pool of molten metal at the downstream location.

11. In an apparatus for making flat glass comprising a forming chamber containing a pool of molten metal and having an upstream, inlet end and a downstream, outlet end; means for delivering molten glass onto the pool of molten metal in the forming chamber in its upstream end, means for advancing the glass in a path along the surface of the pool of molten metal toward the downstream end of the forming chamber; means for cooling the glass during its advance for forming a continuous sheet of glass therefrom; and means for removing the formed sheet of glass from the pool of molten metal and from the forming chamber; the improvement comprising

means for removing a portion of the molten metal from the upstream end of the pool of molten metal,

means for regulating the temperature of the removed molten metal, and

means for directing temperature-regulated metal into the downstream end of the pool of molten metal.

3,928,013

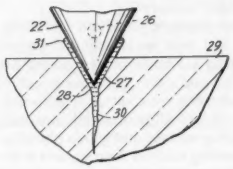
METHOD FOR THE DIRECT MANUFACTURE OF TEMPERED GLASS SHEETS FROM A RIBBON OF GLASS

Walter K. French, Montrose, N.Y., assignor to The Seagrave Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 426,526, Dec. 20, 1973, Pat. No. 3,875,766. This application May 17, 1974, Ser. No. 470,815

Int. Cl.² C03B *21/02*

U.S. Cl. 65—97 **6 Claims**



1. The process for the formation of discrete sheets of tempered glass directly from a flat, continuous band of glass withdrawn from a melt, said band being at a temperature below the softening point, above the strain relief point, and preferably in the range of the annealing point, comprising the steps of forming a score line by drawing a scoring implement pressed against a surface of said sheet transversely across said sheet while continuously supplying to the glass engaging tip of said implement limited quantities of liquid, said liquid being supplied at a rate to prevent lateral flow substantially beyond the path of said score line, thus to define a score line including depthwisely extending fissures into which increments of said liquid have been drawn, thereafter flexing said band about a bending axis extending through said score line, thus to break said band along said line and sever an increment from said band, and thereafter separating said severed increment from said band and subjecting the same to quenching influence to temper the increment.

3,928,014

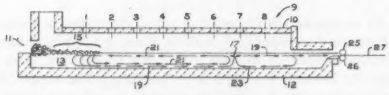
METHOD FOR PRODUCING FLAT GLASS

Leonard A. Knavish, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 29, 1974, Ser. No. 465,053

Int. Cl.² C03B *5/04*

U.S. Cl. 65—136 **11 Claims**



1. A method for producing flat glass, having a high temperature melting glass composition which includes a component which detrimentally volatilizes at the melting temperature, in a continuous tank-type flat glass-producing furnace, said furnace comprising an inlet end wall having a glass batch feeding inlet, a front end wall having an outlet delivering molten glass to a ribbon forming means, and top and botton walls and two generally parallel sidewalls defining a channel through which molten glass flows from the inlet end wall toward the front end wall, said method comprising:

a. feeding glassmaking ingredients to the furnace through the batch feeding inlet to a bath of molten glass already contained in the furnace,

b. flowing said molten glass through said furnace from the inlet end wall to the glass ribbon forming means,

c. applying heat to said molten glass as it is flowing through said furnace, so as to melt the glassmaking ingredients and to maintain said glass in the molten condition; said heating creating convection currents within said molten glass flow and a spring zone of upwardly rising thermal current, said spring zone separating the furnace into a melting zone and a thermal conditioning zone, said melting zone extending from the inlet end wall of the furnace to the spring zone, and the thermal conditioning zone extending from the spring zone to the glass ribbon forming means,

d. regulating the application of heat so as to locate said spring zone near the outlet end of the furnace such that the ratio of the melting zone length to the thermal conditioning zone length is at least **1.25** to **1**,

e. withdrawing a layer of the molten glass which passes substantially uninterruptedly from the spring zone to said ribbon forming means near the top surface of the molten glass from the furnace, through said outlet, and into said ribbon forming means to form a continuous ribbon of flat glass.

3,928,015

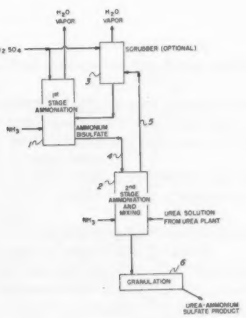
MANUFACTURE OF UREA-AMMONIUM SULATE FROM SULFURIC ACID, AMMONIA, AND UREA

Milton R. Siegel, and Oscar E. Moore, both of Florence, Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 518,413, Oct. 29, 1974. This application June 9, 1975, Ser. No. 580,837

Int. Cl.[2] C05C *3/00, 9/00*

U.S. Cl. 71—28 **13 Claims**



1. A process for the production of solid urea-ammonium sulfate fertilizers from sulfuric acid, ammonia, and urea, which comprises the steps of:

a. simultaneously introducing into a first-stage reacting means a stream of sulfuric acid and a stream of ammonia, said sulfuric acid containing from about 25 to about 95 percent H_2SO_4 and the relative proportions of said ammonia and said sulfuric acid fed thereto sufficient to yield therein an NH_3:SO_4 mole ratio in the range from about 0.7 to about 1.3;

b. retaining the resulting ammonium bisulfate intermediate product in said first-stage reacting means at a temperature in the range from about 200°F to about 350°F for a period of time ranging from about 1 minute to about 15 minutes; said residence time and said temperatures being sufficient to effect predetermined water vapor disengagement mentioned in step (e) infra from said intermediate bisulfate product in said first-stage reacting means;

c. withdrawing from said first-stage reacting means at least a portion of said ammonium bisulfate intermediate product produced therein and simultaneously introducing same, together with a stream of ammonia and a stream of urea, into a second-stage reacting means, the proportion of ammonia fed thereto in relation to said ammonium bisulfate being sufficient to effect therein an NH_3:SO_4 mole ratio ranging from about 1.7 to about 2.0, said urea stream fed to said second-stage reacting means containing from about 95 percent to about 100 percent urea by weight and introducted thereinto at a temperature substantially about equal to the temperature of the material maintained therein ranging from about 270°F to about 320°F;

d. retaining the resulting homogeneous mixture of urea-ammonium sulfate co-melt and particulate ammonium sulfate in said second-stage reacting means for a period of time ranging from about one to about 300 seconds:

e. offgasing from said second-stage reacting means mainly ammonia and water vapor, the quantity of said water vapor so offgased together with that removed by disengagement from said first-stage reacting means in step (b) supra being sufficient in toto to ultimately yield said solid urea-ammonium sulfate product with a moisture content ranging from about 0.1 to about 5 percent by weight and being substantially effected by the autogenous heat of reaction; and

f. removing at least a portion of the resulting homogeneous mixture of urea-ammonium sulfate co-melt and particulate ammonium sulfate, said urea melt containing upwards of about 50 percent of the input ammonium sulfate as co-melt therewith, to granulation means wherefrom is removed as product said solid urea ammonium sulfate.

3,928,016

PROCESS OF MANUFACTURING PHOSPHATE FERTILIZER

Robert Michel, 1000 N. Ashley Drive, Suite 800, Tampa, Fla. 33602

Filed May 22, 1973, Ser. No. 362,869

Int. Cl.[2] C05B *11/16*

U.S. Cl. 71—42 **9 Claims**

1. A process of manufacturing phosphate fertilizer from phosphate rock, which comprises preparing a mixture of crushed phosphate rock, water, and a catalytically effective amount of a catalyst which is a water-soluble iron salt, adjusting the pH of the mixture to an alkaline value and permitting the mixture thus obtained to react at a temperature between about 20° to 80°C until soil-soluble phosphate has been formed.

3,928,017

VIOLURIC ACID AS AN ALGAECIDE

John D. Douros, Jr., and Al F. Kerst, both of Littleton, Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 78,322, Aug. 31, 1970, Pat. No. 3,728,461. This application Dec. 15, 1972, Ser. No. 315,711

Int. Cl. A01n *23/00*

U.S. Cl. 71—67 **34 Claims**

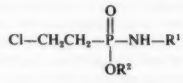
1. A method of killing, preventing and inhibiting the growth of algae which comprises applying an effective algaecidal amount of violuric acid to the algae.

3,928,018
N-SUBSTITUTED-P-(2-CHLOROETHYL)-PHOSPHONAMIDATES AS YIELD IMPROVERS

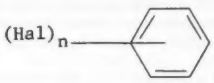
David I. Randall, and Robert W. Wynn, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 230,456, Feb. 29, 1972, abandoned, which is a division of Ser. No. 881,579, Dec. 2, 1969, Pat. No. 3,679,780. This application Feb. 11, 1974, Ser. No. 441,317
Int. Cl.[2] A01N 9/36
U.S. Cl. 71—86 9 Claims

1. A method for increasing plant yield which comprises contacting the plant to be treated with an effective amount of a composition comprising an inert carrier and a plant yield increasing amount of a 2-chloroethyl phosphonamidic ester of the formula:



wherein R^1 is halophenyl, having the formula



wherein Hal is chlorine or bromine, *n* is an integer from 1 to 3 and R^2 is alkyl of one to seven carbon atoms or haloalkyl of one to seven carbon atoms wherein halo is chlorine.

3,928,019
FROTH FLOTATION METHOD

Gary B. Marsh, Woodbridge, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed Nov. 27, 1974, Ser. No. 527,684
Int. Cl.[2] C22B 1/00
U.S. Cl. 75—2 5 Claims

1. In the flotation separation of a calcium-bearing mineral from an ore wherein an ore pulp is dispersed with a soluble alkali silicate, a polyvalent metal salt is used as a depressant for one or more gangue minerals, and a calcium-bearing mineral is floated with a fatty acid collector, the improvement which comprises adding the polyvalent metal salt and the alkali silicate to the pulp in the form of a dilute stable hydrosol obtained by adding to a solution of polyvalent metal salt an agent capable of complexing metallic cations in the salt to form stable complex cations and mixing the resulting solution with a solution of alkali metal silicate.

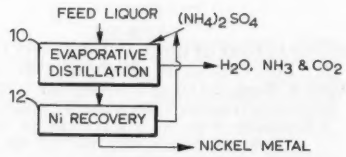
3,928,020
TREATMENT OF NICKEL-BEARING AMMONIUM CARBONATE LEACH LIQUORS

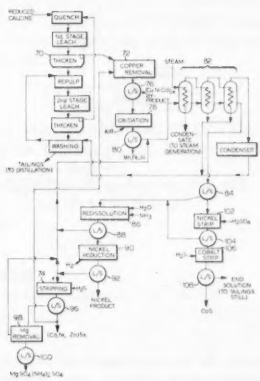
Donald Robert Weir, Fort Saskatchewan, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Filed July 10, 1973, Ser. No. 377,998
Int. Cl.[2] C22B 23/04
U.S. Cl. 75—.5 A 15 Claims

1. The process for recovering nickel in elemental form from a nickel-containing aqueous ammoniacal ammonium carbonate feed liquor which comprises the steps of: adjusting the composition of said liquor such that it contains at least about 1.5 moles of sulphur in the form of dissolved ammonium sulphate per mole of contained nickel; heating said so-adjusted ammoniacal ammonium carbonate liquor to drive off carbon dioxide and ammonia and to produce a nickel diammine sulphate solution having a nickel concentration at least equal to the nickel concentration of said feed liquor; recovering nickel in elemental form from said nickel diammine sulphate solution by reacting said solution (from said heating step) with hydrogen at elevated temperature and pressure to reduce contained nickel to elemental powder form and to produce a reduction end solution containing at least one mole of ammonium sulphate per mole of (recovered) elemental nickel produced; and recycling reduction end solution containing said ammonium sulphate to supply, at least in part, the sulphur requirements of said feed liquor composition adjustment step.

11. The process for recovering nickel in elemental form from a nickel-containing aqueous ammoniacal ammonium carbonate feed liquor which is contaminated with chloride ions which comprises the steps of: adjusting the composition of said liquor such that it contains at least about 1.5 moles of sulphur in the form of dissolved ammonium sulphate per mole of contained nickel; heating said so-adjusted ammoniacal





ammonium carbonate liquor to drive off carbon dioxide and ammonia and to evaporate water therefrom; continuing said heating to form and precipitate a nickel sulphate-ammonium sulphate double salt while leaving said chloride ions in solution; separating said chloride ion containing solution from said precipitated double salt; dissolving said double salt in an ammoniacal solution to form nickel diammine sulphate solution, reacting said nickel diammine sulphate solution with hydrogen at elevated temperature and pressure to reduce contained nickel to elemental powder form and to produce a reduction end solution containing at least 1 mole of ammonium sulphate per mole of elemental nickel produced and recycling reduction end solution containing said ammonium sulphate to supply, at least in part, the sulphur requirements of said feed liquor composition adjustment step.

3,928,021
PROCESS OF REDUCING IRON ORES

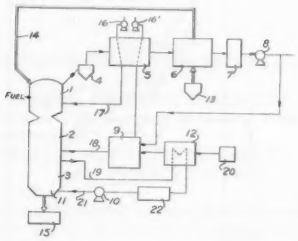
Kenji Matsubara, Yokohama, and Shigeo Kanbara, Chigasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 210,434, Dec. 21, 1971, abandoned. This application Dec. 14, 1973, Ser. No. 424,915

Claims priority, application Japan, Dec. 28, 1970, 45-120075

Int. Cl.² C21B *13/02*

U.S. Cl. 75—35 **4 Claims**



1. A fluidized bed process for the direct reduction of iron ores comprising:

providing a vertical reactor vessel through which ore will fall during reduction and having arranged in vertically descending order a fluidized bed zone, an intermediate zone and a cooling zone;

pelletizing and drying a blend of iron ore and solid reducing agent to provide pellets having a diameter of between 1mm to 15mm;

charging the dried pellets into the fluidized bed zone of said vessel wherein said pellets are fluidized;

maintaining the temperature of said fluidized bed zone within the range of 800°C to 1100°C to thereby reduce the iron ore and to produce a first hot off-gas;

transferring said hot off-gas to a first heat exchanger;

feeding air to said first heat exchanger to obtain hot air;

feeding a portion of said hot air to said fluidized bed zone in order to fluidize the pellets and effect combustion of reductants;

feeding another portion of said hot air to a gasifying furnace to gasify preheated oil therein to produce a reducing gas; blowing said reducing gas into said intermediate zone of the vessel below the fluidized bed zone, whereby the upward flow of said reducing gas will contribute to fluidization of the pellets in the fluidized bed zone and enhance the reduction of the iron ore of the pellets;

removing a second off-gas from the upper portion of the cooling zone immediately below the intermediate zone;

transferring said second off-gas to a second heat exchanger to heat additonal air being fed to said gasifying furnace and thereby cooling said second off-gas;

further cooling the cooled second off-gas from the second heat exchanger;

blowing the twice cooled second off-gas to the lower portion of the cooling zone to cool the reduced pellets; and discharging the cooled reduced pellets into a receiver.

3,928,022
METHOD OF PRODUCING FERROUS METAL OF CONSTANT PROPERTIES FROM HETEROGENEOUS MIXTURES

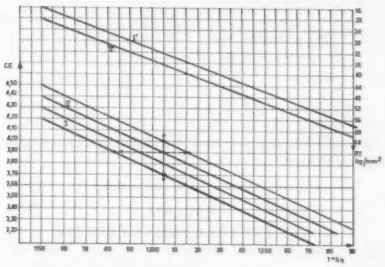
Henri Langagne, Tourcoing, France, assignor to La Bonvarite, Louvroil, France

Filed June 14, 1973, Ser. No. 369,841

Claims priority, application France, June 15, 1972, 72.22936

Int. Cl. C21c *7/00*

U.S. Cl. 75—51 **22 Claims**



1. A method of producing cast irons having predetermined properties from heterogeneous raw materials by melting said raw materials with corrective additives, comprising the steps of charging a furnace with alternate layers of fuel and raw materials, starting the operation of the furnace, continuously introducing ozone into the furnace as well as at least one compound liberating nitrogen and a halogen at the melting temperature of the raw materials, determining melting curves corresponding to different liquidus temperatures for a select range of raw materials as a function of the eutectic temperature by introducing different amounts of one constituent of the raw materials for a given temperature and plotting a diagram thereof, determining from this diagram the amount of said one of the raw materials to be added to any mixture of available raw materials for a given carbon equivalent in view of obtaining the optimum liquidus temperature corresponding to said mixture and the corresponding tensile strength, continuing the melting as a function of the desired relationship of carbon equivalent, eutectic temperature, amounts of said one of the raw materials to be added and tensile strength, thereby directly maintaining the optimum temperature for the desired production.

3,928,023
METHOD OF TREATING OFF GASES FROM IRON PROCESSES

Harry B. Claflin, Upland, Calif., assignor to Kaiser Steel Corporation, Oakland, Calif.

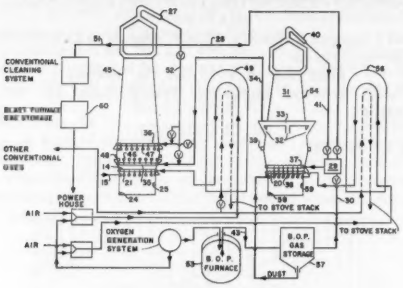
Division of Ser. No. 221,900, Jan. 31, 1972, Pat. No. 3,814,404. This application Sept. 20, 1973, Ser. No. 399,260

Int. Cl.² C21C *7/00*; C21B *3/04*

U.S. Cl. 75—60 **6 Claims**

1. The method of treating off gases from iron processes which comprises establishing a bed of hot solid carbonaceous reducing agent in a reformer, adding an oxidizing gas to said reformer to maintain said solid carbonaceous fuel as a hot bed, conducting said off gases containing CO_2 and fine iron oxide particles to said reformer without an intermediate step that removes said fine particles, and introducing said off gases into the lower portion of said hot bed of carbonaceous solid

reducing agent, whereby iron oxide is reduced to metallic iron and CO_2 is converted to CO, withdrawing molten iron from



the base of said reformer and withdrawing CO containing gas from said reformer.

3,928,024

ORE PRETREATMENT PROCESS

David E. Mueller, and Marnell A. Segura, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 111,680, Feb. 1, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,070

Int. Cl.² C22B *1/11*

U.S. Cl. 75—6 **10 Claims**

1. A method of pretreating a gangue-containing particulate oxidic iron ore to lower the sulfur and phosphorus in the ore which comprises washing a particulate oxidic iron ore consisting essentially of iron oxides and gangue with an aqueous solution of an inorganic base and thereafter washing the ore with water.

3,928,025

TOOL STEEL FOR HOT WORKING

Toshio Okuno, Yasugi, and Rinzo Sasaki, Nagoya, both of Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,740

Claims priority, application Japan, Nov. 28, 1973, 48-132737

Int. Cl.² C22C *38/44, 38/4638/52*

U.S. Cl. 75—128 B **4 Claims**

1. A tool steel for hot working consisting essentially of, in weight percent, from 0.25 to 0.60% carbon, not more than 0.6% silicon, from 0.50 to 1.50% manganese, from 0.50 to 1.50% nickel, from 1.50 to 3.50% chromium, from 2.00 to 4.50% molybdenum, from 1.20 to 3.00% vanadium, from 0.50 to 5.00% cobalt, balance essentially iron and impurities.

3,928,026

HIGH TEMPERATURE NICOCRALY COATINGS

Ralph J. Hecht, West Palm Beach, Fla.; George W. Goward, North Haven, and Richard C. Elam, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed May 13, 1974, Ser. No. 469,186

Int. Cl.² C22C *30/00*

U.S. Cl. 75—134 F **10 Claims**

1. A coating composition for the nickel-base and cobalt-base alloys which consists essentially of, by weight, 11–48% cobalt, 10–40% chromium, 9–15% aluminum, 0.01–1.0% of a reactive metal selected from the group consisting of yttrium, scandium, thorium, lanthanum and other rare earth elements balance essentially nickel, the nickel content being at least about 15%.

3,928,027

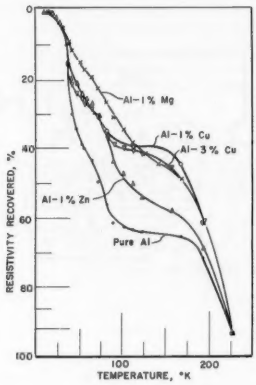
NONSWELLING ALLOY

Samuel D. Harkness, W. Simsbury, Conn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 345,421, March 27, 1973, abandoned. This application Aug. 20, 1974, Ser. No. 499,104

Int. Cl.² C22C *21/12*

U.S. Cl. 75—139 **1 Claim**



1. In a water-cooled nuclear reactor designed for operation in the temperature range of from 0° to 200°C. and to neutron fluences greater than 10^{19} n/cm² (E > 0.1 MeV), the improvement wherein the fuel element cladding and structural material of the reactor consists of an alloy containing 99% aluminum and 1% copper whereby swelling of the cladding and structural material will not occur under irradiation since the alloy exhibits little swelling upon irradiation due to the combined effects of substitutional solute interstitial trapping and second-phase precipitation.

3,928,028

GRAIN REFINEMENT OF COPPER ALLOYS BY PHOSPHIDE INOCULATION

John C. Yarwood, Madison, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 5, 1974, Ser. No. 458,302

Int. Cl.² C22C *9/00, 9/02, 9/05, 1/02*

U.S. Cl. 75—153 **10 Claims**

1. A method of casting molten copper base alloys comprising the steps of:

A. providing a melt of copper base alloy with a content of 0.002 to 0.5% phosphorus at a temperature of 20° to 200°C. above the liquids;

B. then stirring into said melt at said temperature 0.002 to 1.0% of a transition metal selected from the group consisting of Zr, Hf, Ti, V, Cr, Mn and mixtures thereof; and

C. then pouring the molten alloy said temperature into a cooled mold within a period of about 2 minutes after the said addition of transition metal, thereby forming a solidified uniform ingot of fine grain size without substantial loss of said transition metal.

3,928,029

BRAZE ALLOY SYSTEM

Harry R. Fisk, and Jeffrey J. Clark, both of Tempe, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Feb. 27, 1974, Ser. No. 446,434
Int. Cl.² C22C 9/05
U.S. Cl. 75—159 7 Claims

1. A composition adapted for use as a brazing alloy consisting essentially of, in percent by weight, from about 49 to 58 percent copper, about 25 to 32 percent manganese, about 2 to 10 percent nickel, about 7 to 16 percent gold and up to 4 percent cobalt.

3,928,030

COBALT-TUNGSTEN HIGH TEMPERATURE EUTECTIC ALLOY

Edward R. Buchanan, Burnt Hills, and Lemuel A. Tarshis, Latham, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 16, 1971, Ser. No. 163,290
Int. Cl.² C22C 19/07
U.S. Cl. 75—170 4 Claims

1. A directionally solidified cast alloy body consisting essentially in weight percent of 53–57% of cobalt and 43–47% of tungsten, said body having a reinforcing phase of an intermetallic compound having the approximate chemical composition Co_7W_6 dispersed in a matrix phase of a cobalt-tungsten solid solution.

3,928,031

METHOD OF ELECTROPHOTOGRAPHY

Koichi Kinoshita, Narashino, Japan, assignor to Katsuragawa Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 169,654, Aug. 6, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,638
Int. Cl. G03g 13/22
U.S. Cl. 96—1 R 16 Claims

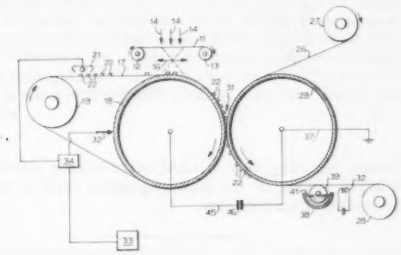
1. A method of electrophotography comprising the steps of preparing a photosensitive element including a highly insulative layer which includes a mixture of highly insulative material and a material highly reflective to visible light rays, said mixture containing at least 5% by weight of said highly reflective material and said highly reflective material comprising fine crystals of metal compound reflecting visible light rays, a photoconductive layer manifesting persistent internal polarization and an electrode layer transparent to visible light rays, said layers being laminated in the order mentioned and bonded together into an integral structure; applying a first electric field across said photosensitive element to deposit a charge of one polarity on the surface of said highly insulative layer; applying a second electric field across said photosensitive element to deposit a charge of the opposite polarity on the surface of said highly insulative layer; projecting a light image upon said photoconductive layer through said electrode layer concurrently with the application of said second electric field whereby to form a latent image corresponding to said light image on the surface of said highly insulative layer; developing said latent image with a colored toner under ambient light to form a powder image; and correcting said powder image during development by adjusting the density of toner while observing the powder image against the reflective background provided by said highly insulative layer.

3,928,032

METHODS OF AND APPARATUS FOR REPRODUCING IMAGES BY TRANSFERRING ELECTROSTATIC CHARGES

Pham Kim Quang, Dieppe, France, assignor to La Cellophane, Paris, France

Filed Dec. 3, 1973, Ser. No. 421,041
Claims priority, application France, Dec. 8, 1972, 72.43711
Int. Cl.² G03G 13/18
U.S. Cl. 96—1 R 3 Claims



1. A method of reproducing an image on an uncharged surface, comprising the steps of:

forming the image of electrostatic charges on an intermediate photoconductive surface;

advancing the photoconductive surface while in contact with a first electrode;

advancing the uncharged surface while in contact with a second electrode juxtaposed with the first electrode to bring the uncharged surface and photoconductive surface into proximity with one another so that there is virtual contact therebetween;

creating a potential difference between the electrodes by charging the first electrode with a corono-charging device while grounding the second electrode, to thereby transfer the image of electrostatic charges to the uncharged surface, said potential difference due to the capacitance determined by the interaction of the electrodes, photoconductive surface and uncharged surface; and

connecting the electrodes with a circuit which includes an auxiliary capacitor having a capacitance substantially higher than the capacitance existing between the electrodes.

3,928,033

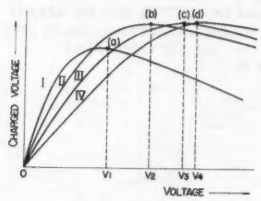
COLOUR ELECTROPHOTOGRAPHIC METHOD IN WHICH THE RECORDING SHEET IS CHARGED TO ITS SATURATION VOLTAGE

Masayasu Anzai, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 1, 1974, Ser. No. 438,610
Claims priority, application Japan, Feb. 5, 1973, 48-13742
Int. Cl.² G03G 13/01
U.S. Cl. 96—1.2 25 Claims

1. An electrophotographic method of reproducing a colour picture on a recording paper sheet from an original picture while successively changing a plurality of colour filters corresponding to the number of required colours and the same number of developers individually producing the complementary colours of the corresponding colour filters and repeating a number of times corresponding to the number of the filters the image-forming process comprising the steps of imparting an electric charge to the entire surface of the recording paper sheet, forming a first charge latent image on the recording paper sheet corresponding to the complementary colour of the first colour filter of the original picture through the first colour filter, developing a first colour image on the recording paper sheet on which the first latent image has been formed

by a first developer producing the complementary colour of the first colour filter, and fixing the first colour image on the recording paper sheet, characterized in that in the electric



charge imparting step in each image-forming process the charged voltage of the recording paper sheet is selected around its saturation value.

3,928,034

ELECTRON TRANSPORT LAYER OVER AN INORGANIC PHOTOCONDUCTIVE LAYER

Paul J. Regensburger, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 94,071, Dec. 1, 1970, abandoned, which is a continuation-in-part of Ser. No. 14,282, Feb. 26, 1970, abandoned. This application Mar. 16, 1973, Ser. No. 341,839

Int. Cl.[2] G03G *5/08, 13/22*

U.S. Cl. 96—1.5 **10 Claims**

5. An electrophotographic plate comprising in successive layers:

a. a conductive substrate,

b. a blocking layer,

c. an inorganic photoconductive layer, and

d. an organic charge transport layer consisting essentially of 2,4,7-trinitor-9-fluorenone; the photoconductive layer having a thickness between 0.02 and 25 microns and dispersed in from 0 to 95 volume percent binder but comprising at least 25 volume percent when an electronically inert binder is employed, the photoconductor binder thickness ranging from 0.05 to 20 microns when a binder is employed; the transport material, if dispersed in an electronically inert binder, is present in a volume ratio of at least 25 percent active transport material to electronically inert binder.

3,928,035

ELECTROPHOTOGRAPHIC ELEMENT WHICH INCLUDES A PHOTOCONDUCTIVE POLYVINYL CARBAZOLE LAYER CONTAINING AN AROMATIC ANHYDRIDE

Denis J. Curtin, Chicago, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed June 7, 1974, Ser. No. 477,301

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 **12 Claims**

1. An electrophotographic element for use in an electrophotographic copy process comprising a substrate having a photoconductive coating on one surface of the substrate comprising 2,4,7-trinitro-9-fluorenone, a polyvinylcarbazole, and an aromatic anhydride in which the materials are present in the composition of which the coating is formed in the ratio of about 0.49 to 1.23 moles of the 2,4,7-trinitro-9-fluorenone per monomeric unit of the polyvinylcarbazole, and 0.05 to 5.0 parts by weight of the aromatic anhydride per 100 parts by weight of the polyvinylcarbazole.

3,928,036

FLEXIBLE XEROGRAPHIC PHOTORECEPTOR ELEMENT

Robert N. Jones, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,554

Int. Cl.[2] G03G *5/04, 5/08*

U.S. Cl. 96—1.5 **3 Claims**

1. A flexible photoreceptor member comprising:

a. a conductive substrate comprising an elastomeric material formed in the shape of a continuous belt, said elastomer containing a second phase which results in electrical conductivity; and

b. a photoconductive layer overlying and bonded to said substrate, said photoconductive layer comprising a polymeric matrix of an electrically insulating elastomeric resin containing therein an interlocking network of photoconductive material in the form of continuous chains which pass through the photoconductive layer thickness, said photoconductor being present in a volume concentration from about 1 to 15 percent by volume of said binder layer, with the outer surface of said layer comprising elastomeric resin material.

3,928,037

TITANIUM DIOXIDE WITH ALUMINUM OXIDE OR ALUMINIUM OXIDE PLUS SILICON DIOXIDE PRECIPITATED THEREON AS PIGMENT FOR DIFFUSION TRANSFER

Louis Maria De Haes, Edegem, Belgium, and Hans-Georg Völz, Krefeld-Bockum, Germany, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed May 15, 1974, Ser. No. 470,271

Claims priority, application Germany, May 16, 1973, 2324590

Int. Cl.[2] G03C *5/54, 7/00, 1/48, 1/40*

U.S. Cl. 96—29 R **25 Claims**

1. In a photographic diffusion transfer reversal process in which a photo-sensitive silver halide emulsion layer is exposed and developed to form a visible negative silver image in the emulsion layer and to transfer either a silver halide complex or a dye to an image receiving layer to make a silver image or dye image visible against a white pigment background layer covering said negative silver image wherein said silver halide emulsion layer forms part of a monosheet material comprising in order, either

A. a non-transparent support, a silver halide emulsion layer, a pigment layer or means for applying a pigment layer and an image receiving layer or

B. a transparent support, an image receiving layer, a pigment layer or means for applying a pigment layer, and a silver halide emulsion layer,

the improvement wherein the pigment particles of the pigment layer consist essentially of white titanium dioxide pigment particles that have been modified by precipitation thereon of hydrated aluminum oxide alone or in admixture with hydrated silicon dioxide.

3,928,038

PROCESS FOR MAKING MULTI-COLOR INTAGLIO PLATES AND CYLINDERS FOR USE IN GRAVURE PRINTING

Michael J. Bergin, Bayside, N.Y., assignor to Intaglio Service Corporation, Long Island City, N.Y.

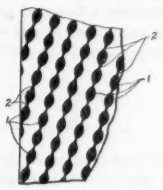
Filed Feb. 28, 1974, Ser. No. 447,005

Int. Cl.[2] G03F *5/00, 7/24*

U.S. Cl. 96—38 **8 Claims**

1. A process of making a set of color separated intaglio plates for use in multi-color gravure printing which comprises the steps of making a set of continuous tone color separated positive transparencies, each of which bears a color separated image corresponding to a specific color different from the specific color of each other image, and assembling each of

said transparencies separately with a transparent halftone screen having closely spaced parallel lines of connected opaque dots extending in a single direction, said dots being of a length greater than their width and with successive dots connected by narrow necks of a width substantially less than



the maximum width of the dots with said lines of connected dots of each of said screens arranged at an angle to the horizontal which is different from the angle to the horizontal at which the corresponding lines of connected dots of each other screen are arranged.

3,928,039

METHOD FOR MODIFYING VESICULAR IMAGES

Ernst Schumacher, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 123,821, March 12, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,585

Claims priority, application Switzerland, Mar. 13, 1970, 3822/70

Int. Cl.² G03C *5/24*

U.S. Cl. 96—48 R **3 Claims**

1. A method for modifying a vesicular image present in a hydrophobic thermoplastic layer selected from the group consisting of polyvinylidene chloride, polymethacrylonitrile, polystyrene and polyepoxide polymers and co-polymers made from acrylonitrile with ethyl acrylate and co-polymers of acrylonitrile with vinylidene chloride into a non-light-scattering image which method comprises allowing a solid or liquid image substance selected from the group consisting of dyestuffs and optical brighteners, the image substance being dissolved in a lipophilic organic solvent, which is capable of causing the hydrophobic thermoplastic bubble walls of the vesicular image to swell, to act on the vesicular image by contacting said lipophilic organic solvent composition with the surface of said thermoplastic layer so that the solution of the image substance is deposited at the image areas rich in bubbles, removing the excess adhering solution and drying the image material.

3,928,040

THE USE OF A POLYVALENT CATION-ORGANIC PHOSPHONIC ACID COMPLEX AS A BLEACHING AGENT

Isao Shimamura, and Haruhiko Iwano, both of Minami Ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami Ashigara, Japan

Filed July 8, 1974, Ser. No. 486,737

Claims priority, application Japan, July 7, 1973, 48-76842

Int. Cl.² G03C *5/32*

U.S. Cl. 96—60 **18 Claims**

1. In a method for developing, bleaching and fixing an image-wise exposed silver halide photographic material, bleaching and fixing comprising separate steps in said method, the improvement comprising bleaching the silver halide photographic material with a bleaching solution containing a polyvalent cation-organic phosphonic acid complex as the bleaching agent and a re-halogenating agent selected from the group consisting of an alkali metal halide and an ammonium halide.

3,928,041

DEVELOPMENT INHIBITOR YIELDING COMPOUND FOR SILVER HALIDE PHOTOGRAPHY

Mitsuto Fujiwhara; Takaya Endo; Ryosuke Satoh; Toyoaki Masukawa, and Takahiro Uozumi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 14, 1973, Ser. No. 424,831

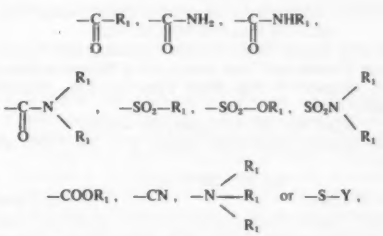
Claims priority, application Japan, Dec. 18, 1972, 47-126217

Int. Cl.² G03C *5/30*

U.S. Cl. 96—66.3 **9 Claims**

1. A method for development of an imagewise-exposed light-sensitive silver halide photographic material which comprises subjecting the imagewise-exposed light-sensitive silver halide photographic material to development in the presence of a development inhibitor-yielding compound having the formula

wherein X is halogen, $-COOR_2$ or $-OZ$, where Z is an alkyl group, aryl group, heterocyclic ring residue, acyl group, or $-SO_2-R_3$, R_3 is an alkyl group, aryl group or heterocyclic ring residue and R_2 is an alkyl group; and R is



where each R_1 is an aliphatic group or an aryl group or two of the R_1 groups may, together with the adjacent nitrogen atom, form a heterocyclic ring residue, and Y is a group which, when the thioether linkage has been split, forms, together with the sulfur atom, a compound having a development-inhibiting action.

3,928,042

PRESERVATIVES FOR PHOTOGRAPHIC DEVELOPERS

Arthur Karchmar, Guttenberg, and Leo Lawrence Nejelski, Jr., Tabor, both of N.J., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 22, 1974, Ser. No. 490,361

Int. Cl.² G03C *5/30*

U.S. Cl. 96—66.4 **14 Claims**

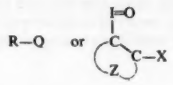
1. An aqueous solution for developing photographic material comprising a silver halide developing agent and as a preservative therefor a compound selected from the group consisting of salts, esters and amides of plicatic acid in an amount effective to extend the storage life of said solution, said amount being at least 0.01% on a weight/volume basis.

3,928,043
PHOTOGRAPHIC ELEMENTS CONTAINING IODOSO OR IODOXY OXIDANTS

Samuel John Ciurca, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,551
Int. Cl.² G03C 1/40, 1/48, 1/10, 1/40
U.S. Cl. 96—77 **23 Claims**

9. A photographic element comprising a support having thereon at least one layer containing a silver halide emulsion, at least one layer containing an image dye-providing material and at least one layer containing an oxidant according to the formulae:



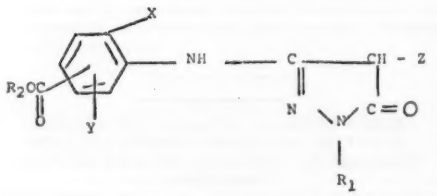
wherein Q is an iodoxy diacetate, R is a group containing a 5- to 7-membered carbocyclic or heterocyclic group covalently bonded to the iodine atom of Q through a carbon atom of said cyclic group, X is a carboxylic acid group or a sulfonic acid group, and Z represents a group containing the atoms necessary to form a 5- to 7-membered ring with the remainder of the atoms of said formula.

3,928,044
MAGENTA COUPLER-CONTAINING PHOTOGRAPHIC SILVER HALIDE MATERIALS

Atsuaki Arai; Yasushi Oishi; Minoru Yamada; Yukio Yokota; Mitsugu Tanaka, and Kozo Inouye, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 14, 1973, Ser. No. 415,853
Claims priority, application Japan, Nov. 15, 1972, 47-114446
Int. Cl.² G03C 1/40
U.S. Cl. 96—100 **20 Claims**

1. A silver halide photographic emulsion containing at least one 3-anilino-2-pyrazol-5-one type nondiffusing magenta coupler of the following formula (I)



(I)

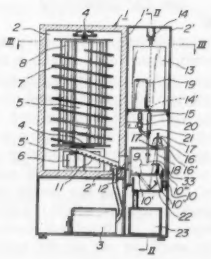
wherein R_1 represents a phenyl group substituted in at least one ortho-position thereof, with an alkyl group, an alkoxy group, an alkylthio group, a cyano group or a halogen atom R_2 represents an alkyl group or an alkyl group substituted with an alkoxy group, an aryloxy group, an acyloxy group, an alkoxycarbonyl group, an acylamino group or a carbamoyl group; or a heterocyclic group selected from the group consisting of a 2-thiazolyl, a 2-benzothiazolyl, a 2-benzoxazolyl, a 2-oxazolyl, a 2-imidazolyl or a 2-benzimidazolyl group; X and Y each represents an alkyl group, aryl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, an amino group, an amido group, a hydroxyl group, a cyano group, a nitro group or a halogen atom and wherein Y additionally represents a hydrogen atom, wherein said

is at the meta or para-position of the phenyl group of said coupler; and Z represents a hydrogen atom or a coupling removable residue which can be removed by coupling with an oxidation product of a primary aromatic amino color developing agent.

3,928,045
AUTOMATIC COOKING AND VENDING MACHINE FOR BOILED NOODLES

Tatsui Tsunoda, Kobe; Santaro Oka, Nishinomiya; Kazuma Miyamoto, Kobe; Makoto Matsumoto, Kobe, and Heiji Baba, Kobe, all of Japan, assignors to Kawatetsu Metrological Equipment and Vending Machine Company, Ltd., Nishinomiya, Japan

Filed Feb. 7, 1975, Ser. No. 547,789
Int. Cl.² A47J 27/18
U.S. Cl. 99—330 **1 Claim**



1. An automatic cooking and vending machine for boiled noodles comprising a casing composed of a refrigeration chamber and a cooking chamber arranged side by side and made integral with each other through a partition wall, said refrigeration chamber being communicated with said cooking chamber through an opening provided at the lower part of said partition wall and normally closed by a door, a vertical rotary drum rotatably journaled in said refrigeration chamber and provided around its periphery with a plurality of radial blades extending along said rotary drum and equidistantly apart from each other, a driving step motor for rotating said drum in a stepwise manner, a stationary spiral chute surrounding said radial blades and extending along said rotary drum, a plurality of containers each containing a bunch of boiled noodles and disposed in a space defined by said radial blades and said spiral chute, each of said containers being provided at its lid with an injection opening, an inclined guide member having one end located directly below the lower outlet end of said spiral chute, a cooking table arranged in said cooking chamber and adapted to be inclined, means for inclining said cooking table and returning it into its original position, a hot water tank and a broth tank arranged above said cooking table and provided with respective supply pipes communicated at their lower ends with an injection pipe adapted to be raised and lowered and extended through said injection opening of said

lid into said container, means for raising and lowering said injection pipe, and electromagnetic valves provided for said supply pipes of said hot water tank and broth tank, respectively, and adapted to open and close said supply pipe of said hot water tank and then simultaneously open both said supply pipes of said hot water tank and broth tank.

3,928,046
BRIGHTENER ADDITIVE FOR INSPECTION PENETRANT DEVELOPERS

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Filed Jan. 17, 1974, Ser. No. 434,228
Int. Cl.² C09D *11/00*
U.S. Cl. 106—19 **8 Claims**

1. In an inspection penetrant process in which a dyed liquid penetrant is applied to test parts, surface penetrant is removed leaving entrapments of said dyed penetrant liquid in any surface flaws, a developer is applied to said test parts, and said parts are inspected for residual entrapments of penetrant liquid in said surface flaws, the improvement wherein said developer is comprised essentially of the following formulation, stated in weight percentages:

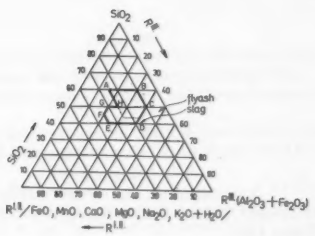
Pigment	10% to 90%
Pyrrolidone-type brightener	.5% to 20%
Wetting agent	Zero to 5%
Glycol	Zero to 5%
Carrier liquid	Zero to 89.5%

said pigment being at least one member selected from the group consisting of:
Talc,
Calcium carbonate,
Magnesium oxide,
Magnesium sulfate,
Silica,
Silica aerogel,
Clay,
Diatomaceous earth,
Barytes, and
Sodium benzoate;
said pyrrolidone-type brightener being at least one member of the group consisting of:
2-Pyrrolidone,
N-methyl-2-pyrrolidone,
N-Vinyl-2-pyrrolidone, and
3.3-Dimethyl-2-pyrrolidone; and
said carrier liquid being at least one member of the group consisting of:
methanol,
ethanol,
isopropanol,
Butanol,
Methylene chloride,
1.1.1-Trichloroethane,
Perchloroethylene, and
Water:
each of said pigment, brightener and carrier liquid ingredients being employed selectively, singly, and in combination.

3,928,047
ARTIFICIAL STONE AND METHOD FOR MAKING THE STONE FROM A COAL BYPRODUCT

László Kapolyi; Imre Kubovits, both of Budapest; Ferenc Kaszanitzky, Tatabanya, and Szabo, Dunaharaszti, all of Hungary, assignors to Tatabanyai Szenbanyak, Tatabanya, Hungary

Continuation of Ser. No. 279,253, Aug. 9, 1972, abandoned, which is a continuation-in-part of Ser. Nos. 27,450, April 10, 1970, abandoned, and Ser. No. 27,461, April 10, 1970, abandoned. This application July 10, 1974, Ser. No. 486,996
Claims priority, application Hungary, Apr. 17, 1969, TA 1016
Int. Cl.² C03C *3/22*; C03B *35/00*, *5/18*, *32/00*
U.S. Cl. 106—39.6 **8 Claims**



1. A process for making artificial stone, which comprises:
a. adjusting the composition of a coal byproduct having a melting point not higher than approximately 1500°C, with at least one chemical ingredient which contains, expressed as an oxide, at least one member selected from the group consisting of SiO_2, Al_2O_3, Fe_2O_3, FeO, MnO, CaO, MgO, Na_2O, and K_2O, to obtain a starting composition which is contained within the area demarcated with bold lines in the phase diagram of FIG. 1 and is defined by corner points marked with the letters from A to H;
b. melting the starting composition between about 1,350°C and about 1,500°C until the contained gases are substantially removed from the melt;
c. forming the resulting melt into objects at a temperature between about 1,200°C and about 1,400°C; then without the need for reheating
d. crystallizing the formed object at a temperature between about 900°C and about 1,300°C for a period of from about 0.5 hour to about 6 hours; and
e. cooling the resulting crystallized object.

3,928,048
ENAMEL GLAZE COMPOSITION

Minoru Kitayama; Kasuyuki Taniguchi; Kyoichi Kaneta, and Kikuzi Hirose, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Dec. 13, 1972, Ser. No. 314,665
Claims priority, application Japan, July 18, 1972, 47-71230; July 20, 1972, 47-71989
Int. Cl.² C03C *5/02*
U.S. Cl. 106—48 **3 Claims**

1. In an enamel glaze composition for coating onto steel sheets of the type composed of an enamel frit and conventional mill additives, the improvement consisting essentially of said composition further containing from 0.03 – 0.3 parts by weight as carbon of an inorganic carbonaceous material and 0.1 – 10 parts by weight of a high valency oxide of a polyvalent metal, per 100 parts by weight of said enamel frit to prevent the formation of fishscale.

3,928,049

ALKALI-RESISTANT MINERAL FIBERS USEFUL FOR THE REINFORCEMENT OF VARIOUS MOULDED ARTICLES

Takashi Otouma; Susumu Aoki, both of Yokohama; Toshihiro Minaki, Yamato-kooriyama; Kenichi Shibata, Nara, and Kentaro Mori, Tokyo, all of Japan, assignors to Japan Asbestos Co., Ltd., Japan

Filed July 2, 1974, Ser. No. 485,135

Claims priority, application Japan, July 19, 1973, 48-80491

Int. Cl.² C03C *13/00*

U.S. Cl. 106—50 **5 Claims**

1. An alkali-resistant glassy fiber usable as a reinforcing material in calcium silicate-containing molded articles and cement- or gypsum-containing molded articles, which consists essentially of 38 to 50.0% by weight of silica; 10 to 35% by weight of iron oxide and manganese oxide; and 15 to 19% by weight of zirconium oxide.

3,928,050

COLORED GLASS COMPOSITIONS

John Jasinski, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 239,725, March 30, 1972, Pat. No. 3,844,796, which is a continuation-in-part of Ser. No. 883,317, Dec. 8, 1969, abandoned. This application Mar. 1, 1973, Ser. No. 337,168

Int. Cl.² C03C *3/04, 3/24*

U.S. Cl. 106—52 **4 Claims**

1. A method of making a Champagne Green colored glass which comprises adding to a colorless flint glass in the forehearth a mixture of colorant oxides consisting of 0.03% to 0.15% Cr_2O_3, 0.01% to 0.04% MnO and 0.005% to 0.015% CoO based on the weight of the composite glass, whereby the composite glass has C.I.E. characteristics for a ten millimeter thickness falling within the following ranges:

DWL (mμ)	560–570
Purity (%)	40–58
Brightness (%)	3–15.

3,928,051

DIELECTRIC GLASSES

James M. Brownlow, Crompond; Relva C. Buchanan, Fishkill, and Rao R. Tummala, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,378

Int. Cl.² C03C *3/10, 3/04, 5/02*

U.S. Cl. 106—53 **5 Claims**

1. A dielectric glass having a thermal coefficient of expansion (from room temperature to 300°C) in the range of approximately 83.9-86.0 × 10^{-7} per °C and a crazing temperature with respect to a magnesium oxide overcoat above about 480°C, consisting essentially of the following ingredients in the following proportions:

	Percent by weight
Lead oxide (PbO)	56.0–56.7
Boric oxide (B_2O_3)	21.0–21.5
Silicon oxide (SiO_2)	12.0–12.5
Alumina (Al_2O_3)	1.0–2.8
Calcium oxide (CaO)	3.5–5.5
Magnesium oxide (MgO)	2.0
Sodium oxide (Na_2O)	2.0.

3,928,052

METHODS AND COMPOSITIONS FOR SEALING SUBTERRANEAN EARTH FORMATIONS

Clarence C. Clement, Jr., Odessa, Tex., assignor to Halliburton Company, Duncan, Okla.

Division of Ser. No. 387,881, Aug. 13, 1973, Pat. No. 3,835,926. This application May 6, 1974, Ser. No. 467,189

Int. Cl.² C04B *7/02*

U.S. Cl. 106—76 **12 Claims**

1. A cementing composition for sealing a highly permeable formation comprising a pumpable slurry which will not set while being agitated and which rapidly sets when in a static condition, said slurry comprising sufficient water to form a pumpable slurry mixed with the components which form a thixotropic composition consisting essentially of hydraulic cement, a silicate compound present in an amount of up to about 18% by weight of dry cement, a hydroxide present in an amount of at least 0.5% by weight of dry cement and a salt present in an amount of about 0.5%–30% by weight of dry cement.

3,928,053

METHOD OF IMPROVING THE GRADE OF PHOSPHORIC ACID BY-PRODUCT GYPSUM TO BE USED AS AN INHIBITOR FOR CEMENT SETTING AND ITS APPARATUS

Yoshiharu Fukuda, Tokyo; Toshio Onishi, Koshigaya, and Akitoshi Takeuchi, Yokohama, all of Japan, assignors to Onoda Cement Company, Ltd., Onoda, Japan

Filed June 4, 1973, Ser. No. 366,402

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² C04B *11/00*

U.S. Cl. 106—109 **1 Claim**

1. Method of improving the grade of phosphoric acid by-product gypsum to be used as an inhibitor for cement setting comprising:

A. Dispersing lime stone powder in hot gas stream to calcine it into quick lime,

B. Dispersing phosphoric acid by-product gypsum powder in hot gas containing said quick lime to calcine it into half hydrated or soluble anhydrous gypsum,

C. Separating calcined quick lime and gypsum from gas and then subjecting said calcined product to hydration.

3,928,054

PRODUCTS OF WOLLASTONITE CRYSTALS AND MANUFACTURING THE SAME

Kazuhiko Kubo, Gifu, Japan, assignor to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Filed Sept. 4, 1973, Ser. No. 394,251

Int. Cl.² C04B *1/00*

U.S. Cl. 106—120 **9 Claims**

1. A method for manufacturing a shaped product of wollastonite crystals comprising the steps of;

1. dispersing agglomerates of wollastonite crystals into water to produce a dispersion of agglomerates of wollastonite crystals, said agglomerates of wollastonite crystals having a substantially spherical shell construction which has a diameter of up to 150μ and comprises a shell and interior space thereby defined, said shell being made of wollastonite crystals containing at least 50% by weight of

β-wollastonite crystals interlocked with one another three-dimensionally,
2. shaping the resulting dispersion of agglomerates of wollastonite crystals into desired shape, and then,
3. drying the resulting shape to produce a shaped product of wollastonite crystals.

3,928,055

METHOD OF PREPARING A COATING COMPOSITION

Sidney Frank Brailsford, Maidstone, and Donald Robson McDonald, Larkfield Green, both of England, assignors to Reed Paper Group Limited, London, England

Continuation of Ser. No. 801,245, Feb. 19, 1969, abandoned. This application Aug. 25, 1971, Ser. No. 175,008

Claims priority, application United Kingdom, Feb. 16, 1968, 7818/68

Int. Cl.² C08L 3/00

U.S. Cl. 106—214 2 Claims

1. A method of preparing a coating composition which comprises:

a. forming a slurry in an aqueous medium of a pigment selected from the group consisting of china clay, whiting and titanium dioxide, and an uncooked or partially cooked starch, and

b. passing the slurry successively through a plurality of continuous agitation milling stages, using sand or glass, steel or plastic beads, whereby the heat generated by said continuous milling stages supplies some of the heat necessary to cook the starch and would raise the temperature of the slurry to about 65°C. without external heating before its discharge from the milling stages and wherein a first one or more of the continuous agitation milling stages is thermally insulated, and a second one or more of said stages is heated to a temperature of from about 85°C. to 100°C. to cook the starch passing therethrough.

3,928,056

PAN RELEASE PRODUCT AND PROCESS

Bernard F. Szuhaj, 303 S. Brewster Ave., Lombard, Ill. 60148

Filed July 29, 1974, Ser. No. 492,763

Int. Cl.² C08H 9/00

U.S. Cl. 106—243 5 Claims

1. A pan release product comprising a mechanical atomizer containing an aqueous suspension of an acylated, hydroxylated lecithin, all of said lecithin being both acylated and hydroxylated, said acylation being carried out to reduce the free amino nitrogen value from about 10% to about 90% relative to crude lecithin, said hydroxylation being carried out with at least 1% hydrogen peroxide by weight of the unmodified lecithin to reduce the iodine value from about 5% to about 20% relative to crude lecithin.

3,928,057

TiO_2 PIGMENT COATED WITH POROUS ALUMINA/SILICA AND DENSE SILICA

Raymond Lew DeColibus, Camden, Tenn., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed May 30, 1974, Ser. No. 474,540

Int. Cl.² C09C 1/36

U.S. Cl. 106—300 18 Claims

1. Coated TiO_2 pigment consisting essentially of a core of pigmentary TiO_2, a porous inner coating of silica and alumina, said silica, calculated as SiO_2, being present in an amount less than about 12% by weight, based on said pigmentary TiO_2, and said alumina, calculated as Al_2O_3, being present in an amount less than about 11% by weight, based on said pigmentary TiO_2, and a dense outer coating of silica in an amount, calculated as SiO_2, between about 2% by weight and about 17% by weight, based on said pigmentary TiO_2.

3,928,058

EXPANDED SYNTHETIC CALCIUM SILICATES

Carl Heinrich Schmitt-Henco, Mainz, and Eberhard Rauschenfels, Wiesbaden, both of Germany, assignors to Dyckerhoff Zementwerke A.G., Wiesbaden, Germany

Filed Dec. 20, 1972, Ser. No. 317,021

Claims priority, application Germany, Dec. 21, 1971, 2163384; Sept. 9, 1972, 2244299

Int. Cl.² C09C 1/02

U.S. Cl. 106—306 13 Claims

1. Synthetic calcium silicate expanded beads having a bubble-like structure, having an external sealing skin and numerous small non-intercommunicating air bubbles in the interior of the bead separated by thin walls, the beads comprising as major constituents CaO and SiO_2 and having a raw grain density below 1.5 g/cc.

3,928,059

HYDROUS MAGNESIUM CONTAINING SILICATE MINERALS WITH REDUCED ABSORBENCIES

Thomas Howard Ferrigno, 29 Clover Hill Circle, Trenton, N.J. 08638

Continuation-in-part of Ser. No. 306,926, Nov. 15, 1972, Pat. No. 3,856,545. This application Oct. 4, 1974, Ser. No. 512,836

Int. Cl.² C09C 1/28

U.S. Cl. 106—306 17 Claims

1. A material adapted for use as a filler or extender in paints, plastics or the like consisting essentially of a calcined agglomerate comprising from about 40 to 75 parts by weight of a hydrous magnesium containing silicate mineral, from about 15 to 40 parts by weight of a feldspar mineral; from about 0 to 10 parts by weight of a fluxing agent selected from the group consisting of boric acid, boric oxide, borax, colemanite, sodium polyphosphates, low melting glasses, frits, lead oxide, barium oxide, soda-lime glasses and eutectic combinations of inorganic oxides; from about 0 to 20 parts by weight of an inorganic colorant; and from about 1 to 6 parts by weight of a temporary binder selected from the group consisting of expanding lattice montmorillonites, soluble silicates, starch, polyglycols, lignin, lignin sulfonates and esters, casein and cellulose derivatives; said agglomerates embodying a plurality of mineral particles having an average size of from about 0.3 to 40 microns bonded together to form agglomerates having an average size of from about 10 microns to ¼ inch and having a porosity of less than about 25% by volume of that of the parent hydrous magnesium containing silicate mineral.

3,928,060

COMPOSITION AND METHOD FOR INHIBITING ASBESTOS FIBER DUST

Malcolm Kent Smith, Mountainside, and Robert Winslow White, Califon, both of N.J., assignors to N L Industries, Inc., Hightstown, N.J.

Filed Aug. 13, 1973, Ser. No. 387,919

Int. Cl.² C08J 7/04

U.S. Cl. 106—308 Q 18 Claims

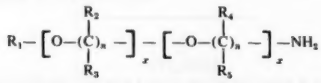
1. A method of processing asbestos fibers to inhibit dusting of said fibers which comprises charging asbestos fibers of from about 1 to about 25 micrometers in length into a treatment zone, coating said asbestos fibers with an effective amount to inhibit fiber dusting of an anti-dusting agent consisting essentially of the partially esterified reaction product of a polyhydroxy compound derived from a C_2 to C_8 alkyne and a compound selected from the group consisting of saturated and unsaturated C_1 through C_6 carboxylic acids and their anhydrides for a predetermined time period, agitating said fibers during said coating step and drying said fibers at room temperature after agitation.

3,928,061
ASPHALT COMPOSITIONS HAVING IMPROVED ADHESION TO AGGREGATE

Martin Edvin Hellsten, Odsmal; Anders William Klingberg, and Stig Erik Svennberg, both of Stenungsund, all of Sweden, assignors to Mo och Damsjo Aktiebolag, Ornskaldsvit, Sweden

Filed Apr. 23, 1973, Ser. No. 353,271
Claims priority, application Sweden, Apr. 26, 1972, 5527/72
Int. Cl.² C08L *95/00;* **C09D** *3/24*
U.S. Cl. 106—273 N **19 Claims**

1. An asphalt composition having improved adhesion to aggregate comprising asphalt and an amount to improve the adhesion of the asphalt to aggregate of an ether amine having the formula:



wherein:

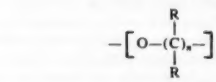
R_1 is a hydrocarbon group having from about six to about 16 carbon atoms and selected from the group consisting of alkyl and alkenyl;

R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen and alkyl radicals having from one to about two carbon atoms;

n_1 and n_2 are numbers within the range from one to about four;

x_1 and x_2 are numbers within the range from zero to about five, the sum of x_1 and x_2 being from one to five;

the total number of carbon atoms in each

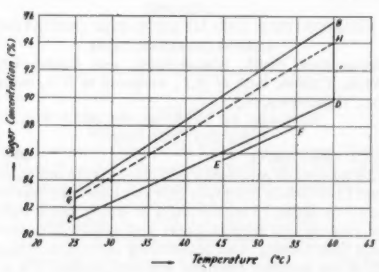


unit being from one to about four.

3,928,062
METHOD FOR OBTAINING ANHYDROUS FRUCTOSE CRYSTALS

Toshio Yamauchi, Kyoto, Japan, assignor to Dai-ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Jan. 22, 1974, Ser. No. 435,525
Claims priority, application Japan, Feb. 12, 1973, 48-17718
Int. Cl.² C13K *9/00*
U.S. Cl. 127—60 **10 Claims**



1. A process for obtaining anhydrous fructose crystals without the formation of fructose hemihydrate or fructose dihydrate crystals from an aqueous solution of fructose, which comprises:

a. seeding anhydrous fructose crystals into a metastable supersaturated solution of fructose in water having an initial sugar concentration of less than 92% (dry basis) of total sugar comprising 88–99% fructose and a temperature of 25°–60° C. located at a point within the range defined by points G, H, C and D in FIG. 1 of the accompanying Drawing;

b. simultaneously crystallizing anhydrous fructose from said solution and concentrating said solution by evaporation under reduced pressure at a rate sufficient to shift the equilibrium between the solid and liquid phases of the resultant system in a direction which increases the degree of supersaturation of the liquid phase within said range to continuously crystallize anhydrous fructose from said metastable supersaturated solution without the formation of hemihydrate or dihydrate crystals; and

c. recovering anhydrous fructose crystals from the resultant mother liquor having a fructose concentration within said range.

3,928,063
METHOD FOR CLEANING A CRYSTAL MICROBALANCE

William H. King, Jr., Florham Park, and Gideon M. Varga, Jr., Clark, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed June 5, 1974, Ser. No. 476,601
Int. Cl.² B08B *7/02;* **H04R** *17/10*
U.S. Cl. 134—1 **7 Claims**

1. A method for removing particles from the surface of a piezoelectric crystal used in its measuring mode as a microbalance, comprising the steps of:

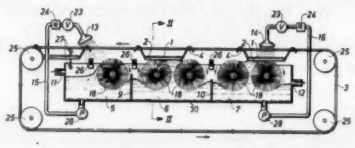
a. applying a variable electrical AC voltage to said crystal, thereby generating variable frequency signals in a frequency range extending from a lower frequency below the natural clean resonant frequency of said crystal to an upper frequency above said natural clean resonant frequency of said crystal, whereby said crystal vibrates in different vibrational modes corresponding to said frequency range spanning said natural clean resonant frequency; and

b. vibrating said crystal as in step (a) at a relatively high power compared to the power at which said crystal vibrates in its measuring mode, whereby said particles are dislodged from and vibrated off of said crystal and thereby said crystal is substantially cleaned of any particles present on the surface thereof.

3,928,064
METHOD FOR CLEANING PLATE-SHAPED OBJECTS

Kurt Anders Holm, Skoghall, Sweden, assignor to Uddeholms AB, Sweden

Filed July 11, 1974, Ser. No. 487,733
Claims priority, application Sweden, Aug. 8, 1973, 7310894
Int. Cl.² B08B *1/02;* **15** *77;21 D;102;3.15*
U.S. Cl. 134—6 **2 Claims**



1. A method of cleaning plate-shaped objects by moving the objects past a tub containing a cleaning liquid and having a plurality of brushes mounted therein, comprising conveying the plate-shaped objects across and above the tub, serially arranging the brushes in the tub along the path of movement of the objects with at least certain of the brushes disposed in pairs and partially immersed in the cleaning liquid, positioning

the periphery of the brushes above the top of the tub so as to come into contact with the plate-shaped objects, and rotating one brush of a pair in the opposite direction as the rotation of the other brush of the pair, so as to form a meniscus therebetween contacting the surface of the object being cleaned.

3,928,065
COMPOSITION FOR CLEANING METAL COOKWARE

Richard Savino, Park Ridge, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,399
Int. Cl.² B08B *3/08, 7/04;* **C11D** *7/20, 7/50*
U.S. Cl. 134—7 **6 Claims**

1. A detergent composition in fine particulate form suitable for use in removing adhering carbonized food debris from metal surfaces comprising in admixture:

i. one part by weight of a solvent selected from the group consisting of N-methyl-2-pyrrolidone, N-ethyl-2-pyrrolidone, N-isopropyl-2-pyrrolidone, and 2-amino-2-methyl-1-propanol, and mixtures thereof, and

ii. about 3 parts to about 9 parts by weight of sedimentary kaolin.

6. A process for removing hardened adhering food debris from metal surfaces comprising the steps of:

i. covering said debris with a flowing, particulate mixture comprising about 3 parts to about 9 parts by weight of sedimentary kaolin and one part by weight of a solvent selected from the group consisting of N-methyl-2-pyrrolidone, N-ethyl-2-pyrrolidone, N-isopropyl-2-pyrrolidone, or 2-amino-2-methyl-1-propanol, and mixtures thereof,

ii. contacting said mixture with hot water at 120°F to about 200°F, to form an aqueous cleansing medium,

iii. allowing said aqueous cleansing medium to stand for at least 10 seconds and until at least a part of said debris has loosened, and

iv. rinsing said aqueous cleansing medium and said loosened debris from said metal surface.

3,928,066
ELECTROLYTIC CELL WITH MINIMAL WATER DISSIPATION

Hoshea L. Lewenstein, 118 Mason Terrace, Brookline, Mass. 02146

Filed May 7, 1974, Ser. No. 467,711
Int. Cl.² H01M *39/04*
U.S. Cl. 136—6 L **11 Claims**

1. A rechargeable battery comprising:

a lead anode;

a lead dioxide cathode;

a sulfuric acid electrolyte within a container thereof, said lead anode and said lead dioxide cathode being immersed in said electrolyte; and

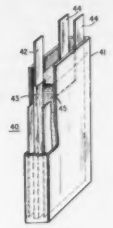
a quaternary ammonium compound located within said container in contact with said electrolyte, said compound being soluble in water to form an anion and a quaternary ammonium cation.

3,928,067
POLYALKYLENE GLYCOL ETHERS IN RECHARGEABLE LITHIUM NONAQUEOUS BATTERIES

John Broadhead, Morristown; Thomas Michael Putvinski, Scotch Plains, and Forrest Allen Trumbore, Summit, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 6, 1974, Ser. No. 503,853
Int. Cl.² H01M *10/00*
U.S. Cl. 136—6 LN **6 Claims**

1. A nonaqueous secondary battery comprising a lithium negative electrode, a positive electrode, electrolyte and microporous polymer separators in which the electrolyte consists essentially of a solvent, 0.01–2.0 molar lithium salt, where the lithium salt is selected from the group consisting of LiI and $LiClO_4$, and other dopants characterized in that the other

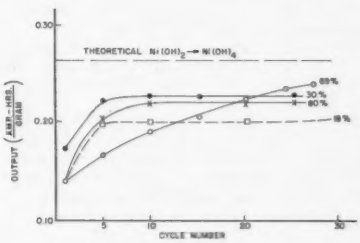


dopants are 1–5 weight percent of tetraglyme and 0.01–0.6 molar tetrabutylammonium iodide.

3,928,068
ACTIVE ELECTRODE COMPOSITION AND ELECTRODE

John F. Jackovitz, Monroeville; Earl A. Pantier, Verona, and Christopher K. Wu, Turtle Creek, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 20, 1974, Ser. No. 471,731
Int. Cl.² H01M *43/04*
U.S. Cl. 136—24 **16 Claims**



1. A composition comprising:

A. a hydrated mixture of nickelous carbonate and nickelous hydroxide in a molar ratio of about **0.5** to about **1.5**; and

B. a compound selected from the group consisting of $CoCO_3$, $Co(OH)_2$, hydrates thereof, and mixtures thereof, wherein the number of cobalt atoms in said composition is about 2 to about 10 percent of the number of nickel atoms.

9. A method making an active electrode material comprising:

A. preparing a composition which comprises:

1. a hydrated mixture of nickelous carbonate and nickelous hydroxide in a molar ratio of about 0.5 to about 1.5;

2. a compound selected from the group consisting of CoO_2, $Co(OH)_2$, hydrates thereof, and mixtures thereof, where the number of cobalt atoms in the composition is about 2 to about 10 percent of the number of nickel atoms;

3. sufficient water to form a slurry; and

4. a suitable oxidant in an amount sufficient to oxidize about 30 to about 75 percent of the nickel and cobalt atoms to a quadrivalent state;

B. permitting said oxidant to oxidize about 30 to about 75 percent of the nickel and cobalt atoms to a quadrivalent state; and

C. separating the solids from said water.

3,928,069
METHOD FOR CUTTING OUT SUBSTANTIALLY RECTANGULAR ELECTRODES FROM A CONTINUOUS BAND OBTAINED BY SAID METHOD AND CELLS EMBODYING SAID ELECTRODES

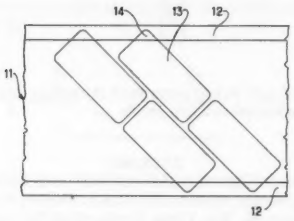
Francis Sperandio, Le Bouscat, and Michel Leturque, Lormont, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Sept. 5, 1974, Ser. No. 503,252

Claims priority, application France, July 12, 1974, 74.24356

Int. Cl. H01m *35/18*

U.S. Cl. 136—75 **8 Claims**



1. Method for cutting out substantially rectangular electrodes from a continuous strip comprising at least one zone uncoated with active material parallel to its longitudinal edges, characterized in that the edges of the electrodes are cut out obliquely in relation to the longitudinal axis of the strip so that angular corners of said electrodes are cut out in the uncoated zone of said strip.

5. An electrode comprising a rectangularly shaped body coated with active material in all its area except a corner portion of triangular configuration that is bare of said active material.

7. An electrochemical cell comprising a positive electrode, a negative electrode, and separator means between the electrodes forming a stack, electrolyte and a casing, said positive electrode comprising rectangularly shaped body with active material in all its area except a corner portion of triangular configuration bare of said active material.

3,928,070
ELECTROLYTE FOR ORGANIC ELECTROLYTE CELLS

Ronald G. Gunther, Mystic, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.

Filed Mar. 28, 1974, Ser. No. 455,580

Int. Cl.² H01M *6/04*

U.S. Cl. 136—83 R **15 Claims**

1. An improved current-producing, organic electrolyte cell which comprises an operable combination of an anode, a cathode, and an organic electrolyte substantially free of water and in which the improvement comprises a non-ionic surfactant which is soluble in said organic electrolyte and which is present in said cell in an amount of at least about 0.01 percent by weight of the weight of said organic electrolyte.

3,928,071
HERMETICALLY SEALED PRIMARY BATTERY

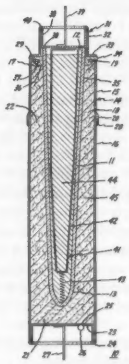
Roy F. Thornton, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 4, 1974, Ser. No. 512,150

Int. Cl.² H01M *23/00*

U.S. Cl. 136—83 R **3 Claims**

1. A hermetically sealed primary battery comprising an inner casing of a solid sodium beta-alumina ion-conductive material with one open end, an outer metallic casing comprising an upper portion and a lower portion, the upper portion with opposite open ends, an inwardly extending flange affixed to the upper portion at its first open end, the lower portion with an open and a closed end, the upper and lower portions sealed together at their associated open ends, the outer metallic casing surrounding the inner casing with the exterior surface of the flange on a lower plane than the surface of the open end of the inner casing and spaced from the inner casing, a metallic closure consisting of a cap portion with a flange and a cap insert, the flange of the cap portion positioned adjacent the flange of the upper portion of the outer metallic casing, a first glass seal sealing together the adjacent flanges of the upper portion of the outer metallic casing and of the cap portion of the metallic closure and sealing the adjacent flanges



to the outer wall of the inner casing adjacent its open end, a second glass seal sealing together the opposite surface of the flange of the upper portion of the outer metallic casing and a portion of the outer wall of the inner casing, the cap insert positioned within and sealed to the cap portion thereby closing the open end of the inner casing, an electronic conductor affixed to the interior surface of the cap insert and positioned within the interior surface of the inner casing, an anode selected from the class consisting of sodium, sodium as an amalgam, and sodium in a nonaqueous electrolyte in one of the casings, and a cathode in the other casing, the cathode functioning with a sodium type anode and a solid sodium beta-alumina ion-conductive electrolyte.

3,928,072
AIR DEPOLARIZED ELECTRIC CELL

Gerard Gerbier, and Pierre Depoix, both of Poitiers, France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed July 18, 1974, Ser. No. 489,603

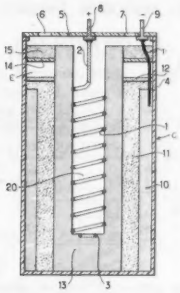
Claims priority, application France, Aug. 1, 1973, 73.28166; May 6, 1974, 74.15618

Int. Cl.² H01M *29/04*

U.S. Cl. 136—86 A **8 Claims**

1. Air depolarized electric cell comprising a negative electrode occupying a peripheral position, an electrolyte and a positive mass occupying a central position within said negative electrode, said positive electrode having a funnel located in the center of the positive mass, a metallic current collector

disposed in said funnel in contact with the walls of said funnel, the said current collector comprising at least one metallic wire



arranged along the wall of said funnel and at least partly embedded in the positive mass.

3,928,073

SOLAR CELLS

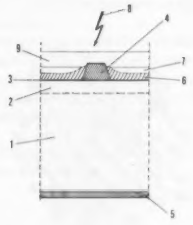
Jean Georges Besson, Meudon; Thuoc Nguyen Duy, Ivry, and Wolfgang Palz, Paris, all of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Continuation of Ser. No. 351,034, April 13, 1973, abandoned. This application Oct. 9, 1974, Ser. No. 513,461

Claims priority, application France, Apr. 19, 1972, 72.13738; May 3, 1972, 72.15599

Int. Cl.² H01L *31/02*

U.S. Cl. 136—89 **10 Claims**



1. A solar cell comprising a p-type doped semi-conductor body in whose upper part, exposed to the incident light, there is provided a thin n-type doped zone in the form of a continuous layer, the cell being covered in its lower part by a continuous metal electrode and in its upper part by a metal collector grid constituted of metal bars, wherein the n-type doped layer between the bars of the collector grid is covered by an insulating layer which is transparent to the incident radiation, said insulating layer being itself covered by a conductive layer which is also transparent to the incident radiation and insulated from the collector grid, said conductive layer being maintained at a fixed potential.

3,928,074

PRIMARY CELL WITH NEGATIVE ELECTRODE

Gerd Jung, and Jakob Bauer, both of Ellwangen, Germany, assignors to Varta Batterie Aktiengesellschaft, Germany

Filed Apr. 17, 1974, Ser. No. 461,512

Claims priority, application Germany, Apr. 21, 1973, 2320555

Int. Cl.² H01M *17/00*

U.S. Cl. 136—100 M **9 Claims**

1. Primary cell with a negative zinc or magnesium electrode and a positive depolarizer electrode and an electrolyte comprising a soluble polyethylene glycol monoalkyl ether, as corrosion inhibitor, the alkyl having from eight to 22, and preferably from eight to 18 carbon atoms.

3,928,075

CONSUMABLE FUEL ELEMENT FOR BATTERY APPLICATIONS

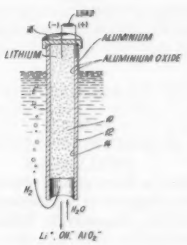
Dieter Bass, Baie D'Urfe, Canada, assignor to Canada Wire and Cable Limited, Toronto, Canada

Filed July 15, 1974, Ser. No. 488,410

Claims priority, application Canada, June 21, 1974, 203111

Int. Cl.² H01M *13/00*

U.S. Cl. 136—100 R **17 Claims**



1. A water-activated fuel element comprising:

a. an alkali metal consumable anode;

b. a consumable cathode of aluminum or aluminum alloys in intimate contact with at least a portion of the surface of said anode, said cathode corroding in aqueous solutions of alkali metal hydroxide of a pH higher than 9 which are formed by the electrochemical reaction of said alkali metal with water;

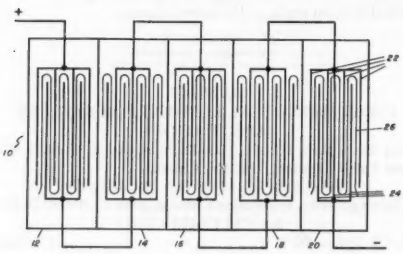
c. an insulating layer separating said anode from said cathode along the contact area of anode and cathode and which is dissolved in aqueous solutions of said alkali metal hydroxide, said insulating layer being of a minimum thickness to insure intimate contact but no electrical short-circuit between said anode and cathode, and the thickness of said anode, cathode, and insulating layer being selected to assure constant mean rate of consumption of all parts of the fuel element as long as the element is in contact with water; and

d. electrical connections to said anode and cathode for withdrawing electric energy from the fuel element.

3,928,076
LiCl INHIBITOR FOR PERCHLORATE BATTERY

James R. Moser, deceased, late of Shrewsbury, Pa., and by Karen Moser, executrix, Bakersfield, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 13, 1974, Ser. No. 505,825
Int. Cl.² H01M 17/02
U.S. Cl. 136—100 M 4 Claims

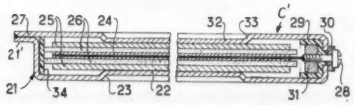


1. A cell comprising a magnesium anode, a cathode and an electrolyte consisting essentially of aqueous magnesium perchlorate, wherein the electrolyte contains lithium chloride in sufficient amount to inhibit the self-discharge reaction at said anode.

3,928,077
CASING FOR AN ELECTROCHEMICAL CELL HAVING SMALL BULK

Francis Sperandio, Le Bouscat, and Michel Guglieri, Bassens, both of France, assignors to Saft-Societe des Accumulateurs Fixes et de Traction, Fomainville, France

Filed Sept. 5, 1974, Ser. No. 503,253
Claims priority, application France, July 12, 1974, 74.24355
Int. Cl.² H01M 21/00
U.S. Cl. 136—111 2 Claims

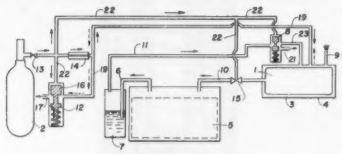


1. An electrochemical cell comprising a casing, electrolyte, a first electrode of one polarity, a second electrode and a third electrode both of like opposite polarity located respectively on each side of the first electrode, separator means between the electrodes and electrolyte within said casing, said casing comprising a metal sheet member having the shape of a shallow cup, a central part of the bottom of said casing being offset inwardly of said casing in relation to the remainder of said bottom and defining a peripheral rim in permanent contact with the said second electrode irrespective of outward deformation of said cell during use, and said cell also comprising a lid of insulating material over which the said member is crimped and terminal means connected to the first electrode sealingly mounted on said lid.

3,928,078
AUTOMATICALLY ACTIVATED BATTERY ASSEMBLY

Hans-Kurt Kothe, Kelkheim, Taunus, and Rudi Schneider, Falkenstein, Taunus, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hanover, Germany

Filed June 5, 1974, Ser. No. 476,719
Claims priority, application Germany, June 8, 1973, 2329362
Int. Cl.² H01M 1/06
U.S. Cl. 136—114 6 Claims

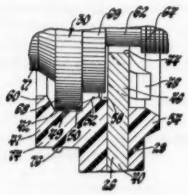


1. Automatically activated battery assembly comprising a battery having a plurality of cells, an electrolyte chamber separated from said cells, electrolyte activation line means connecting said cells with said electrolyte chamber, gas venting line means distinct from said electrolyte activation line means connecting said cells with said electrolyte chamber, valve means connected in said gas venting line means and having a vent opening, pressure gas chamber means connected by an activation gas line means to said electrolyte chamber, valve means connected in said activation gas line means and having a vent opening, an aperture member connected in said electrolyte activation line means, and adjustable venting means communicating with said activation gas line means for decreasing pressure in said activation gas line means.

3,928,079
BATTERY CABLE WITH DETACHABLY RETAINED CONNECTOR

Gene A. Jennings, Bristolville; John J. Streitferdt, Warren, and Lyle B. Suverison, Fowler, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 7, 1974, Ser. No. 512,869
Int. Cl.² H01M 5/00; H01R 3/02
U.S. Cl. 136—135 S 2 Claims



1. In a battery cable comprising an elastomeric cap having a transverse aperture therethrough, a cable terminal at least partially embedded in the elastomeric cap, said cable terminal having an aperture aligned with said cap aperture and portions adjacent said cable terminal aperture disposed in said cap aperture and a connector for mechanically and electrically connecting the cable terminal to a battery terminal, said connector having a portion disposed in said cap aperture between said cable terminal portions adjacent said cable terminal aperture and an entrance of said cap aperture, the improvement comprising, said cap having integral lip means extending inwardly toward the axis of said cap aperture and spaced axially from said cable terminal portions disposed in said cap aperture toward said cap aperture entrance, said lip means and

said cable terminal portion cooperatively axially retaining said connector portion in said cap aperture, said lip means having an interference fit with said connector portion and being sufficiently flexible to permit said connector portion to be pushed past said lip means for detachable retainment between said lip means and said cable terminal portions.

3,928,080

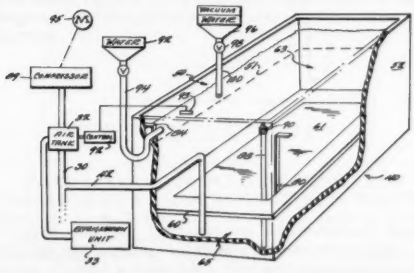
PANCAKE BATTERY

Robert R. Aronson, Ferndale, Mich., assignor to Electric Fuel Propulsion Incorporated, Troy, Mich.

Continuation of Ser. No. 26,218, April 7, 1970, abandoned. This application Aug. 3, 1973, Ser. No. 385,324

Int. Cl.² H01M 2/38

U.S. Cl. 136—160 6 Claims



1. A battery comprising,

a plurality of plates mounted substantially horizontally within said battery each comprised of a metallic grid with a paste applied thereto and wherein the thickness of said grid is 20 thousandths of an inch ± 2 thousandths and the thickness of said plate is 23 to 27 thousandths of an inch, a case for containing said plates and an electrolyte and having a region above said plates and a region below said plates so that electrolyte in said region above said plates flows through said plates to said region below said plates, means defining a passage between said upper and lower regions, said passage being separated from the region occupied by said plates including a tube and one way valve means in said tube preventing downward movement of said electrolyte,

means for transporting electrolyte in said region below said plates to said region above said plates via said tube including means for introducing air, at least intermittently, into said region below said plates so that said electrolyte moves up said passage into said region above said plates, and

means for cooling said air before introduction into said region below the plates.

3,928,081

METHOD FOR FABRICATING SEMICONDUCTOR DEVICES USING COMPOSITE MASK AND ION IMPLANTATION

James A. Marley, Jr., Saratoga, and Bohumil Polata, Los Altos, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Oct. 26, 1973, Ser. No. 409,903

Int. Cl.² H01L 7/44

U.S. Cl. 148—1.5 17 Claims

10. A method for fabricating semiconductor devices from a semiconductor body having a planar surface, forming a layer of material to be utilized as a mask on said surface, forming substantially simultaneously a plurality of openings in the layer of material to expose areas of said surface, selectively doping the exposed areas defined by said openings in sequence and selectively covering said openings so that the areas exposed thereby are not doped until the proper time in said sequence.

3,928,082

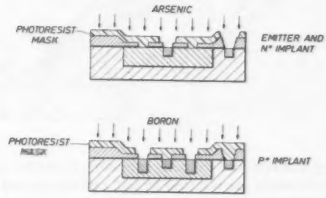
SELF-ALIGNED TRANSISTOR PROCESS

Frederic Nickels Schwettmann, Richardson, and John Luther Prince, III, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 28, 1973, Ser. No. 429,257

Int. Cl.² H01L 21/265

U.S. Cl. 148—1.5 6 Claims



5. The process of claim 1, wherein said P+ conductivity producing impurity is selected from the group consisting of aluminum and boron.

3,928,083

PROCESS FOR PRODUCING AN ENAMELLING STEEL SHEET

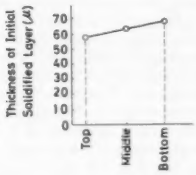
Hisashi Gondo; Hiroshi Takechi; Kazuo Namba, all of Kisarazu; Matsuo Usuda, and Kouichi Kawasaki, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 7, 1974, Ser. No. 448,958

Claims priority, application Japan, Mar. 9, 1973, 48-27169

Int. Cl.² C21D 7/02, 7/13, 9/46

U.S. Cl. 148—2 12 Claims



1. A process for producing an enamelling steel sheet which comprises tapping molten steel with a manganese content of not more than 0.40%, lowering the carbon content in the molten steel to not more than 0.01%, adding titanium to the molten steel in an amount enough to obtain a titanium content between 0.01 and 0.3%, and adding one or more elements selected from the group consisting of the rare earth elements in a total amount between 0.01 and 0.15%, casting the molten steel into ingot or slab, hot rolling and then cold rolling the ingot or slab and then annealing the steel sheet.

3,928,084

TIP FOR AN INDUSTRIAL GAS CUTTING TORCH AND METHOD OF USING SAME

Berwyn E. Etter, P.O. Box 11965, St. Petersburg, Fla. 33733

Filed June 7, 1974, Ser. No. 477,631

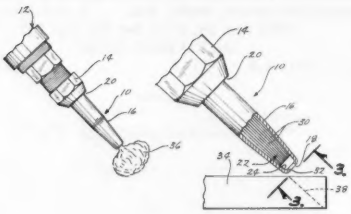
Int. Cl.² B23K 7/02

U.S. Cl. 148—9 1 Claim

1. The method of cutting a beveled edge on a sheet of flat material with a cutting torch means including a cutting tip

having a longitudinal axis said cutting tip being configured so as to produce a mushroom-shaped preheating flame, comprising,

holding the cutting tip so that its longitudinal axis is positioned with respect to said plate in the direction of said bevel cut,



creating a mushroom-shaped preheating flame by supplying a combustible gas mixture to said cutting tip and igniting said mixture,

and maintaining the mushroom-shaped preheating flame in contact with the plate until the bevel cut has been made.

3,928,085

TIMEPIECE MAINSPRING OF COBALT-NICKEL BASE ALLOYS HAVING HIGH ELASTICITY AND HIGH PROPORTIONAL LIMIT

Katsumi Yamamura; Hiroshi Harigaya, both of Suwa, and Yasuo Sakai, Sendai, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 250,927, May 8, 1972, abandoned, which is a continuation-in-part of Ser. No. 876,551, Nov. 13, 1969, abandoned. This application June 10, 1974, Ser. No. 478,136

Int. Cl.[2] C22C *19/07*

U.S. Cl. 148—11.5 F **10 Claims**

6. The process of manufacturing a mainspring for a timepiece, comprising the steps of forming an alloy by melting in vacuum at a temperature between 1,400°C and 1,600°C a composition consisting essentially of 30–50% Co, 25–35% Ni, at least one member selected from the group consisting of Cr in the range of 6–9 percent, Mo in the range of 8–12 percent, and W in the range of 2–9 percent, the total weight of Cr, Mo and W being in the range 15–30 percent, at least one member selected from the group consisting of Ti in the range 0.05–5 percent, Nb in the range 0.1–6 percent and Be in the range 0.01–3 percent, less than 2% Mn, less than 1.5% Si and less than 5% Fe, quenching said alloy for 10–90 minutes from 1,100°–1,200°C hot-forging, hot-rolling and cold-processing said alloy to reduce the cross-sectional area by at least 80 percent.

3,928,086

HIGH STRENGTH DUCTILE STEEL

Donald J. Bailey, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 2, 1974, Ser. No. 529,010

Int. Cl.[2] C21D *6/02, 9/46*

U.S. Cl. 148—12.3 **4 Claims**

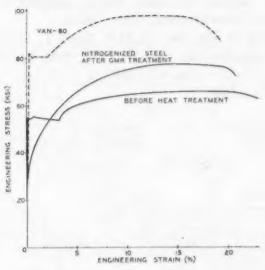
1. The method of producing a high yield strength steel comprising the steps of:

heating an aging low carbon steel to a temperature within the alpha plus gamma region of the iron carbon phase diagram for a time sufficient to dissolve a substantial proportion of the carbon into the ferrite of said steel and to form a predetermined proportion of said steel into austenite,

quenching said steel to substantially retain the solubilized carbon in solution and to transform at least the major proportion of said austenite into a form selected from the group consisting of martensite and bainite,

plastically deforming the steel an amount equivalent to at least 2 percent on the tensile stress-strain diagram,

aging said deformed steel for time sufficient to develop a desired superior yield strength,



said predetermined proportion of austenite being an amount necessary to provide the aged steel with said yield strength when said steel is deformed at least the equivalent of 2 percent on the tensile stress-strain diagram.

3,928,087

METHOD OF STRENGTHENING LOW CARBON STEEL AND PRODUCT THEREOF

Rollin E. Hook, Dayton, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Division of Ser. No. 306,390, Nov. 14, 1972, Pat. No. 3,847,682. This application May 30, 1974, Ser. No. 474,514

Int. Cl.[2] C21D *9/48*

U.S. Cl. 148—36 **2 Claims**

1. Cold reduced and annealed steel sheet stock having a thickness between about 0.02 inch and 0.09 inch, an average yield strength of at least 70 ksi, and sufficient formability to permit fabrication into articles other than deep drawn, consisting essentially of less than about 0.010% carbon, from about 0.05 to about 0.6% manganese, from about 0.02 to about 0.04% total aluminum, up to about 0.035% sulfur, up to about 0.01% oxygen, residual silicon and phosphorus, at least one nitride-forming element chosen from the group consisting of titanium, titanium and columbium, titanium and zirconium, and titanium and mixtures of columbium and zirconium, with total titanium ranging between about 0.08 and 0.10 percent, total columbium ranging between about 0.03 and 0.06 percent, total zirconium ranging between about 0.03 and 0.06 percent, sufficient nitrogen to combine substantially completely with said aluminum and said nitride-forming elements, and remainder essentially iron, all percentages being by weight.

3,928,088

FERRITIC STAINLESS STEEL

Donald K. Schlosser, Shillington; Lewis P. Myers, and Robert L. Caton, both of Reading, all of Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Nov. 9, 1973, Ser. No. 414,257

Int. Cl.[2] C22C *38/22, 38/60*

U.S. Cl. 148—37 **12 Claims**

1. A ferritic stainless steel consisting essentially in weight percent of about

Carbon	0.08 Max.
Manganese	2.5 Max.
Silicon	1 Max.
Phosphorus	0.04 Max.
Sulfur	0.50 Max.
Chromium	17.5–19.5
Molybdenum	1.5–2.5
Nickel	0.5 Max.
Copper	0.5 Max.
Nitrogen	0.06–0.20

the balance being essentially iron and incidental impurities, in which selenium can be substituted for all or part of the suflur on a 1 for 1 basis and tungsten can be substituted for all or part of the molybdenum in the ratio of about 1.5% tungsten to 1% molybdenum, and said stainless steel when annealed at about 1,200°–1,600°F and quenched after having been hot worked from about 1,800°–2,200°F contains about 5 to 50% highly tempered partially decomposed martensite free of acicular structure.

3,928,089
RARE EARTH INTERMETALLIC COMPOUNDS PRODUCED BY A REDUCTION-DIFFUSION PROCESS

Robert E. Cech, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 352,427, April 19, 1973, abandoned. This application July 24, 1974, Ser. No. 491,608The portion of the term of this patent subsequent to July 24, 1990, has been disclaimed.

Int. Cl.² H01F *1/02*

U.S. Cl. 148—105 **4 Claims**

1. A process for preparing a magnetic material comprised of a particulate rare earth intermetallic compound comprising providing a halide of a rare earth metal except samarium, europium and ytterbium, admixing in at least substantially stoichiometric amounts particles of said rare earth metal halide, calcium hydride and a solid metal selected from the group consisting of cobalt, cobalt-manganese alloys, cobalt-iron-manganese alloys or cobalt-iron alloys, heating the resulting particulate mixture in an atmosphere which is inert to it at a temperature ranging from about 850°C to about 1,000°C decomposing said calcium hydride and effecting reduction of said rare earth metal halide to produce the rare earth metal, continuing heating the resulting mixture in an atmosphere which is inert to it at a temperature which diffuses the resulting rare earth metal into said solid metal group member to form the rare earth intermetallic compound, and recovering from the rare earth intermetallic compound-containing mixture said rare earth intermetallic compound.

3,928,090
HEAT TREATMENT OF STEEL

Keith Randerson, Middlesbrough, England, assignor to British Steel Corporation, London, England

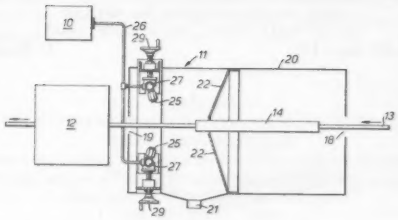
Filed Mar. 8, 1973, Ser. No. 339,309

Claims priority, application United Kingdom, Mar. 9, 1972, 11087/72

Int. Cl.² C21D *1/18*

U.S. Cl. 148—134 **13 Claims**

1. A method of heat treating a steel body having surface scale comprising applying a stream of water at an impact force of at least 2.5 kg/cm² over substantially the whole of the surface of the body while it is red heat or higher temperature to remove the scale and subsequently subjecting the body without substantial further scale formation to a conventional accelerated cooling process from a temperature above its change point to a lower temperature through transformation



to achieve a higher cooling rate during said conventional accelerated cooling process without descaling.

3,928,091
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING SELECTIVE OXIDATION

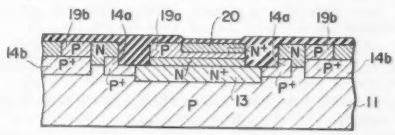
Seiichi Tachi, and Hideki Moriyama, both of Kodaira, Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 292,640, Sept. 27, 1972, abandoned. This application Aug. 12, 1974, Ser. No. 496,899

Claims priority, application Japan, Sept. 27, 1971, 46-74684; Oct. 20, 1971, 46-82457; Oct. 10, 1971, 46-88994

Int. Cl.² H01L *21/76, 27/04*

U.S. Cl. 148—175 **7 Claims**



1. A method for manufacturing a semiconductor device comprising the steps of:

a. forming a first semiconductor region of a first conductivity type and a relatively low resistivity partially on a major surface of a semiconductor substrate of a second conductivity type and a relatively high resistivity;

b. forming a second semiconductor region of the second conductivity type and a relatively low resistivity on the major surface of the substrate except for the surface of said first semiconductor region;

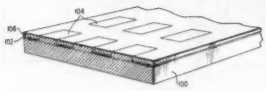
c. depositing a semiconductor layer of the first conductivity type and a relatively high resistivity, so as to embed said first and second semiconductor regions thereunder; and d. selectively oxidizing said semiconductor layer from the surface thereof, so as to form an insulating layer of the semiconductor material extending to said second semiconductor region in said semiconductor layer, said insulating layer being connected to said second semiconductor region at the bottom surface thereof and surrounding the portion of said semiconductor layer formed on said first semiconductor region at the side surface thereof.

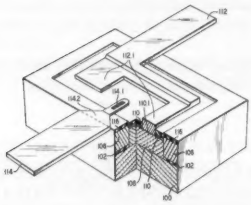
3,928,092

SIMULTANEOUS MOLECULAR BEAM DEPOSITION OF MONOCRYSTALLINE AND POLYCRYSTALLINE III(A)-(A) COMPOUNDS TO PRODUCE SEMICONDUCTOR DEVICES

William Charles Ballamy, Reading, Pa., and Alfred Yi Cho, New Providence, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 28, 1974, Ser. No. 501,154
Int. Cl.² H01L *21/203, 29/04, 21/76, 29/48*
U.S. Cl. 148—175 **17 Claims**





1. A method of fabricating planar isolated semiconductor devices comprising the steps of:

a. forming an amorphous insulative layer on a major surface of a substrate comprising a compound of a Group III(a)-V(a) material; said substrate being at least semi-insulating;

b. removing selected portions of said amorphous layer to form a plurality of windows which expose the underlying substrate;

c. placing said substrate in an evacuable chamber;

d. reducing the pressure of said chamber to a subatmospheric pressure;

e. preheating said substrate to a temperature in the range of 450° to 675° C approximately; and

f. directing at least one molecular beam comprising at least one Group III(a) element and at least one Group V(a) element at said major surface so that monocrystalline material comprising a compound of said elements is deposited in said windows and on said substrate and simultaneously polycrystalline material comprising the same compound of said elements is deposited on said amorphous layer, said polycrystalline material being of sufficiently high resistivity to produce electrical isolation between said devices formed in separate ones of said windows and being substantially coplanar with said monocrystalline material.

3,928,093

METHOD FOR MAKING A BI-DIRECTIONAL SOLID STATE DEVICE

Eric Henry van Tongerloo, Minnetonka, Minn.; Abd-El-Fattah Ali Ibrahim, Ottawa, Canada; Douglas Roy Colton, Kanata, Canada, and John Lawrence, Freelton, Canada, assignors to Northern Electric Company Limited, Montreal, Canada

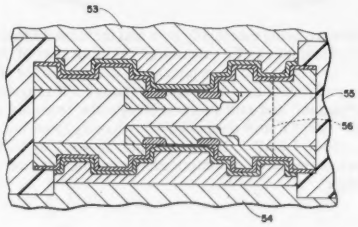
Filed June 3, 1974, Ser. No. 475,659
Int. Cl.² H01L *21/223*
U.S. Cl. 148—186 **3 Claims**

1. A process for making a bi-directional solid state device, comprising:

forming an oxide layer on each surface of a substrate wafer of one semiconductor type;

photoengraving simultaneously on both sides of said wafer to define aligned base regions;

simultaneously diffusing base regions to have a semiconductor type opposed to said substrate;



photoengraving simultaneously on both sides of said wafer to define aligned emitter regions in said base regions;

simultaneously diffusing emitter regions to have a semiconductor type the same as said substrate;

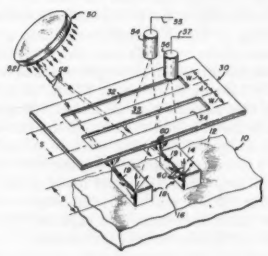
forming electrical contacts to said base and emitter regions.

3,928,094

METHOD OF ALIGNING A WAFER BENEATH A MASK AND SYSTEM THEREFOR AND WAFER HAVING A UNIQUE ALIGNMENT PATTERN

James B. Angell, Portola Valley, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Jan. 16, 1975, Ser. No. 541,463
Int. Cl.² H01L *21/308*
U.S. Cl. 148—187 **19 Claims**



1. A method of aligning a wafer beneath a mask comprising:

forming a first plurality of spaced-apart steps of predetermined length on a wafer such that the edges of said steps define a pattern of parallel lines;

positioning the wafer beneath a mask having a first set of symmetrical openings spaced-apart by a distance substantially equal to said predetermined length such that the ends of said steps appear under said openings;

illuminating the wafer with rays of light directed parallel to a plane perpendicular to said edges and incident upon said edges at an oblique angle relative to the top surface of the wafer;

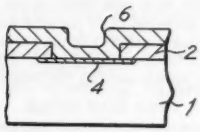
simultaneously detecting first diffraction scattered light emanating from one end of said steps and passing through one of said openings and second diffraction scattered light emanating from the other end of said steps and passing through the other of said openings; and

moving the wafer relative to the mask until said first light has a predetermined relationship to said second light.

3,928,095
SEMICONDUCTOR DEVICE AND PROCESS FOR MANUFACTURING SAME

Hiroshi Harigaya, Suwa; Masao Kanai, Shimosuwa, and Toshio Kano, Suwa, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation-in-part of Ser. No. 304,699, Nov. 8, 1972, abandoned. This application July 26, 1974, Ser. No. 492,109
Int. Cl.² H01L 7/34
U.S. Cl. 148—188 10 Claims

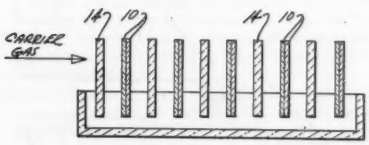


1. The improvement in a process for the formation on a silicon substrate of a surface region containing 10^{14} –10^{17} impurity atoms/cm³ introduced by diffusion and to which reliable ohmic metallic contact can be made, wherein said improvement comprises the steps of holding a silicon substrate having an apertured film of SiO_2 thereon at a temperature of 500° – 700°C for a period between 2 and 40 minutes in a first atmosphere consisting of an inert gas, silane and a gaseous impurity source to form a layer of polycrystalline silicon containing the impurity from said source on said substrate and apertured film, said polycrystalline Si layer containing 10^{14} –10^{17} impurity atoms/cm³, replacing said first atmosphere with a second atmosphere including oxygen and free of silane and said impurity source, and holding said substrate at a temperature between 900° and 1250°C for a period between 5 and 60 minutes to effect concurrent diffusion of said impurity from said polycrystalline silicon into said substrate at the aperture in said film and oxidation of said polycrystalline silicon layer to form SiO_2 containing said impurity.

3,928,096
BORON DOPING OF SEMICONDUCTORS

Peter J. Vergano, Toledo, Ohio, and William E. Smith, deceased, late of Toledo, Ohio (by Frederick L. Smith, administrator), assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 7, 1974, Ser. No. 431,211
Int. Cl.² H01L 7/44
U.S. Cl. 148—189 12 Claims



1. In the process for doping a semiconductor, wherein a semiconductor and a solid dopant host for vapor phase transport of B_2O_3 are maintained in vapor phase communication at a temperature and for a time sufficient to form a zone of P type conductivity in said semiconductor, the improvement wherein said solid dopant host comprises a glass-ceramic body consisting essentially of:

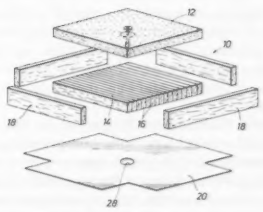
Component	Mole %
SiO_2	2–50
Al_2O_3	15–36
B_2O_3	10–50
MgO	15–36

said body being substantially free of alkali metal oxides, and said body being rigid and dimensionally stable during the doping period.

3,928,097
PROCESS AND MACHINE FOR MANUFACTURING INSULATION MODULES

Robert A. Sauder, and Gary R. Kendrick, both of Emporia, Kans., assignors to Sauder Industries, Inc., Emporia, Kans.

Filed Mar. 1, 1974, Ser. No. 447,359
Int. Cl.² B29C 17/04
U.S. Cl. 156—213 44 Claims



1. A process for the manufacture of insulated enclosure liner modules, said process comprising:

severing from a stack of sheets of fibrous insulation material a plurality of generally rectangular battens of substantially similar size and disposed in side to side relationship, each of said battens being composed of a thickness of fibrous insulation material and having side and edge surfaces, said edge surfaces being of smaller dimension than the dimension of said side surfaces, said battens cooperating to define a pad of insulating material;

forming a fibrous pad of generally rectangular configuration, the edge surfaces of said battens being exposed at the side surfaces of said pad;

providing a substrate of a dimension corresponding to the dimension of said pad and supporting said substrate;

coating at least one of the side surfaces of said substrate with an adhesive material;

securing a connecting member to said substrate prior to assembly of said substrate and said fibrous pad, said connecting member extending from a coated surface of said substrate;

protecting said connecting member from said adhesive material during coating of said substrate;

bringing said pad unit into intimate engagement with said coated surface of said substrate; and

retaining said pad unit and substrate in a state of compression during curing of said adhesive material.

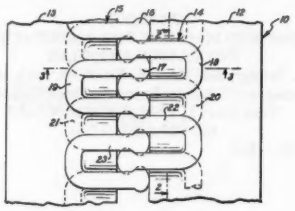
21. A machine as recited in claim 20, including:

means for at least partially enclosing said insulation module assembly in a protective wrapping, said wrapping maintaining said module under a degree of compression during full curing of said adhesive material.

3,928,098
METHOD OF MANUFACTURING THREADLESS SLIDE FASTENER CHAINS

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 225,146, Feb. 10, 1972, Pat. No. 3,885,274, which is a continuation-in-part of Ser. No. 64,487, Aug. 17, 1970, abandoned. This application Aug. 21, 1974, Ser. No. 499,230
Int. Cl.² B32B 31/20
U.S. Cl. 156—73.4 8 Claims



1. A method of forming a threadless slide fastener chain from a carrier tape and a filamentary stringer having a plurality of head elements connected to a plurality of heel members by a plurality of legs, said method comprising the steps of

forming a plurality of raised interstitial portions on the carrier tape along one lateral edge thereof conforming to interstices defined by said heel members and legs of said filamentary stringer,

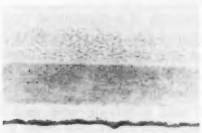
disposing said filamentary stringer, along the one lateral edge of said carrier tape with said plurality of legs and heel members overlying said carrier tape and with said interstitial portions being at least partially displaced into the interstices of said filamentary stringer, and

threadlessly bonding each of said heel members to said carrier tape and said interstitial portions thereby firmly attaching said filamentary stringer to said carrier tape.

3,928,099
PROCESS OF PRODUCING PRESSURE SENSITIVE RECORDING SHEETS

Hiro Ohotsubo; Suguru Fujikura, and Yoshimitsu Miyata, all of Ibaragi, Japan, assignors to Oji-Yuka Synthetic Paper Company, Ltd., Tokyo, Japan

Filed Apr. 30, 1973, Ser. No. 355,379
Int. Cl.² B32B 27/24
U.S. Cl. 156—83 103 Claims



70. In a process for manufacturing a autogeneous self-marking pressure sensitive recording sheet comprising a thermoplastic, colored resin substrate having adhered thereto a surface layer of a different color from the substrate, which layer exhibits a writing surface comprising a plurality of microvoids, comprising the steps of:

contacting the surface layer, the surface layer comprising a polymer of styrene and uniformly dispersed fine particles of rubbery polymer, the surface layer being at least uniaxially stretched to deform the fine particles of rubbery polymer, the fine particles of rubbery polymer being retained in the deformed state in the styrene polymer film, with a swelling agent for the polymer of styrene for a period of time and at a temperature sufficient to swell at least the surface of the surface layer, whereby the fine particles of rubbery polymer which were deformed by the stretching are no longer retained in the deformed state because the swelling softens the styrene polymer and releases the retaining force on the fine particles, which, due to their rubbery nature, return to their original non-deformed shape and create microvoids in the surface layer, rendering the surface layer opaque, the improvement wherein:

the surface layer further contains a resin, in an amount of less than 15% by weight based on the weight of the surface layer, different from the fine particles of rubbery polymer which is softer than the polymer of styrene and which has a lower softening point than the polymer of styrene and which satisfies the following formula:

$$To - T > 3 \text{ seconds:}$$

wherein T_o = time in seconds for a test surface layer treated in n-heptane at 45°C to reach a whiteness value (L value) of 83 ± 2%;

and T = time in seconds for the same test surface layer but containing 5% of the resin, based on surface layer weight, treated in n-heptane at 45°C to reach a whiteness value (L value) of 83 ± 2%;

the test surface layer used to determine compliance with the formula consisting of 94% by weight polymer of styrene component and 6% by weight of polybutadiene component, having fine particles of a size of 0.1 to 10μ uniformly dispersed therein, and having a melt index of 2.2g/10 min., 18 – 19 wt% of insolubles in toluene and the polymer of styrene component having an $[\eta]$ toluene ^{30} = 0.8,

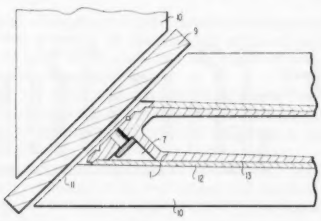
the test surface layer being laminated to a substrate of the same composition but containing 1% Phthalocyanine Blue;

the laminate being simultaneously biaxially stretched at 128°C 4× in the longitudinal and width directions, whereby the test surface layer and substrate thicknesses after stretching are 12μ and 23μ, respectively: whereby the crushability of the surface layer is increased.

3,928,100
CORNER JOINT FOR HOLLOW PROFILE MEMBERS OF PLASTIC WITH REINFORCING FRAME

Alexander Heuschen, Troisdorf; Hans Schaefer, Cologne; Wolfgang Budich; Robert Krah, both of Troisdorf-Sieglar, and Karl Obermeier, Rheidt, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Division of Ser. No. 236,639, March 21, 1972, Pat. No. 3,836,274. This application June 20, 1974, Ser. No. 481,336
Int. Cl.² B32B 7/08
U.S. Cl. 156—92 7 Claims



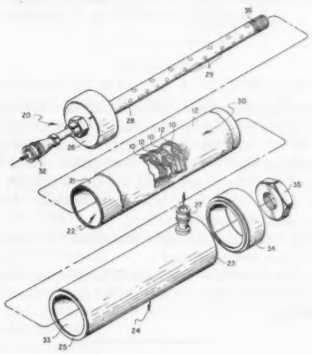
1. A process for the production of a corner joint formed of a pair of miter-cut profile members made of synthetic plastic material and each having a hollow internal metallic reinforcing frame disposed therein with a surface substantially coincident with the miter-cut surface of said profile member, the steps comprising

inserting into said metallic reinforcing frame of each profile member a connector having a miter surface with a plurality of asymmetrical grooves and projections thereon and an outwardly projecting edge until the outwardly projecting edge contacts the end of said reinforcing frame,
heating only the miter surface of each profile member with a one-piece, closed heating member,
pressing together the miter surfaces of said profile members until the grooves and projections on said connectors come into registration, and
securing said connectors together with fastening means.

3,928,101
METHOD OF FABRICATING A ROLLING DIAPHRAGM SEAL

Jerry Tucker, Waco, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 7, 1974, Ser. No. 449,178
Int. Cl.² B65C *3/26*
U.S. Cl. 156—156 **8 Claims**

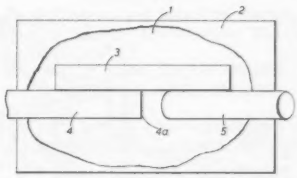


1. A method of fabricating a composite seal material for a flexible rolling diaphragm seal capable of retaining pressures up to 3000 psi in a temperature range between −40°F to 170°F in an operating system such as a rocket engine, the composite seal fabrication process comprises the steps of:
rolling a sheet of rubber material in a tubular form on a rolling mill, and cutting said tubular form to two or more equal lengths previously selected,
cutting two or more lengths of seamless tubular woven cloth to substantially correspond to the previously cut lengths of said rubber material,
sliding one of said lengths of said tubular rubber material over a thin-walled flexible tube bladder,
alternately sliding a length of said tubular cloth followed by a length of said rubber material over the tube bladder, building up a composite material to a desired thickness, sliding said tube bladder with said alternate layers of said composite material thereon into a heavy-walled pressurizable cylinder,
pressurizing the interior of said flexible tube bladder to compress said alternate layers of material between the outside wall of said flexible bladder and the inside wall of said heavy-walled cylinder,
evacuating the space between said outside wall of said flexible bladder and the inside wall of said heavy-walled cylinder by vacuum pump means to further compress said alternate layers of material on said bladder to a uniform thickness,
heating said pressurized cylinder containing said bladder and said alternate layers of composite material in a heated oven for approximately 240 minutes at temperatures ranging from 250°F to 370°F to fuse and cure said layers of material into said flexible composite seal material on the bladder, and
removing said cured composite seal material from said tube bladder, and bonding at least a pair of seal attachment rings to said composite seal material to facilitate mounting in place, the flexible composite seal material so prepared for retaining said pressure and said temperatures in said operating system.

3,928,102
JOINING OPTICAL WAVEGUIDES

Stephen Henry Rowe, Bristol; John Charles Bass, Northampton, and Robert Charles Goodfellow, Blisworth, all of England, assignors to Plessey Handel und Investments A.G., Essex, England

Filed Dec. 7, 1972, Ser. No. 313,012
Claims priority, application United Kingdom, Dec. 22, 1971, 59845/71
Int. Cl.² B29D *11/00*; **B65H** *69/02*
U.S. Cl. 156—158 **15 Claims**

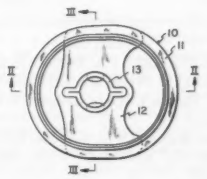


1. A method of joining a first optical fibre end-to-end with a second optical fibre which includes providing a reference line, placing the first and second fibres so as to touch and lie parallel to the reference line and holding said fibers so positioned by surface tension of a liquid, adjusting the alignment of the first and second fibres while so held, and joining the first and second fibres to each other while held in the adjusted positions by the surface tension of the liquid.

3,928,103
HIGH ELONGATION VOIDED ELASTOMERIC BUSHINGS AND METHOD AND MEANS FOR THEIR ASSEMBLING

Gary L. Hipsher, Logansport, Ind., and Robert D. Vosburgh, Birmingham, Mich., assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 330,910, Feb. 9, 1973. This application June 7, 1974, Ser. No. 477,243
Int. Cl.² B32B *31/20*
U.S. Cl. 156—160 **5 Claims**



1. A method of assembling an elastomeric bushing comprising an elastomeric insert disposed in substantial compressive elongation in excess of 10% between a rigid inner sleeve axially aligned with a rigid outer sleeve, said assembled bushing defining at least one void of selected size and shape axially aligned between said sleeves and extending completely through said bushing, the steps comprising:

a. placing a spacer member substantially the size and shape of said void in a recess defined through the length of said elastomeric insert;

b. compressively inserting said insert together with said spacer member between said sleeves to assemble said bushing; and

c. withdrawing said spacer member from said void leaving said void as defined by said spacer member after said bushing is assembled.

3,928,104
METHOD OF MAKING CONCRETE PIPES

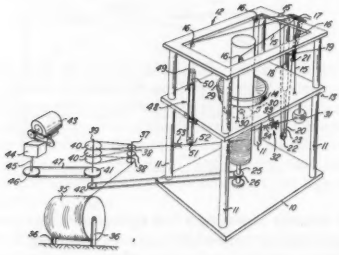
Peter Robert Luckett; Jack Sidney Mobbs, both of Ashford, and Alan James Harris, London, all of England, assignors to Stelmo Limited, Ashford, England

Filed May 18, 1973, Ser. No. 361,686

Claims priority, application United Kingdom, May 19, 1972, 23600/72

Int. Cl.² B28B *21/48*, *21/64*; B65H *81/00*

U.S. Cl. 156—171 **15 Claims**



1. In a method of manufacturing reinforced concrete pipes comprising the known steps of casting a layer of concrete onto the peripheral surface of a mandrel, and winding helically a wire reinforcing member around the concrete layer, the wire reinforcing member being tensioned to form a prestressed reinforcing layer for the concrete pipe; the improvement including the steps of consolidating and retaining the concrete on the mandrel by helically winding a flexible binding member around said layer of concrete before it has set and before the wire reinforcing member is applied, tensioning the wire reinforcing member and winding it under a substantial tension onto the consolidated and retained concrete before it has set, preserving tension in the wire reinforcing member after it is wound onto the concrete and is prevented by the presence of the binding member from cutting into the inner layer of green concrete to any substantial degree, and permitting the concrete to set with the wire under tension and without expansion of the mandrel.

3,928,105
AUTOMATED APPARATUS AND PROCESS FOR MAKING MATCH MOLDED COVERING

Derek J. Holden, Sarnia, Canada, assignor to Fiberglas Canada Limited, Canada

Filed May 4, 1973, Ser. No. 357,385

Int. Cl.² B31F *1/00*; F16L *59/00*

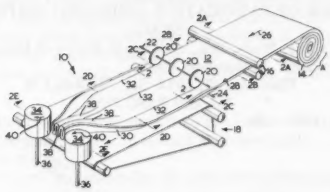
U.S. Cl. 156—200 **19 Claims**

1. In an automated process adapted to produce a prefabricated, match molded covering for a conduit of a selected precisely dimensioned cross-sectional configuration the steps of,

conveying a pliable felted mass of an insulating material along a path, the felted mass being of indeterminate length and disposed generally in a plane, said felted mass containing at least 75% by weight of randomly oriented, discrete or discontinuous, glass or mineral fibers and a substantially liquid heat sensitive bonding material in uncured condition, and having a density of up to 2 pounds per cubic foot;

forming a line of weakening in one surface of the felted mass, by locally depressing said surface along a line parallel to said path;

deforming the felted mass to create a corrugation projecting out of said plane and extending longitudinally by applying a compressive force laterally and along the longitudinal side edges of the felted mass, the deforming occurring about the line of weakening to place said line interiorly of the corrugation;



compressing successive portions of the deformed felted mass while subjecting said mass to heat, to cause hardening of the bonding material and impart rigidity and dimensional stability to the corrugated felted mass to a density ranging from about 3.5 to 10 pounds per cubic foot and having said selected precisely dimensioned cross-sectional configuration;

releasing the dimensionally stabilized, corrugated felted mass from pressure; and

cutting the stabilized, corrugated felted mass longitudinally to provide mating portions of the match molded conduit covering.

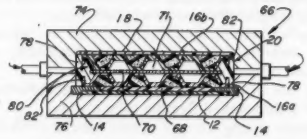
3,928,106
METHOD OF MANUFACTURING A SKI

Arpad A. Molnar, Boulder, Colo., assignor to Molnar & Co., Inc., Boulder, Colo.

Filed May 14, 1974, Ser. No. 469,654

Int. Cl.² B31F *1/22*

U.S. Cl. 156—210 **15 Claims**



1. A method of manufacturing a ski comprising the steps of: forming a pair of elongated corrugated structural sheets with open channels therein in the general pheripheral configuration of the ski to be manufactured,

forming a bottom sheet to conform in general peripheral configuration to that of the structural sheets,

filling at least one of the open channels in at least one of the structural sheets with a filler material,

applying a layer of adhesive material to at least one of the structural sheets so that when the structural sheets are placed in face-to-face abutting relationship, the contacting surfaces of the structural sheets will be bonded leaving open tubular passages between the structural sheets, placing the structural sheets in face-to-face relationship with the adhesive material therebetween to bond the structural sheets into a unified structural body,

affixing the bottom sheet to one face of the unified structural body, and

applying a top layer to the opposite face of the unified structural body.

3,928,107
MANUFACTURE OF GASKETS

Henry W. Brooks, Epping, England, assignor to Engineering Components Limited, Slough, England

Filed July 9, 1974, Ser. No. 486,814

Claims priority, application United Kingdom, July 13, 1973, 33467/73

Int. Cl.² B29C *17/07*; **B29D** *23/10*

U.S. Cl. 156—217 **10 Claims**

1. A method of producing cork gaskets comprising the steps of forming at least two tubes of cured cork composition sheet material, the inside diameter of one tube being substantially the same as the outside diameter of the other tube, assembling the tubes one inside the other with a layer of adhesive at their interface, bag-moulding the assembly around a form whilst curing the adhesive, followed by slicing through the axis of the moulded assembly to produce thin sections.

3,928,108
METHOD OF MAKING A POLY(METHYL METHACRYLATE) PRE-HOLOGRAPHIC ELEMENT

Arnold Adicoff, and Warren J. Murbach, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 12, 1974, Ser. No. 496,419

Int. Cl.² B32B *31/12*, *31/24*, *23/08*; **G03C** *5/00*

U.S. Cl. 156—246 **5 Claims**

1. A method for manufacturing a pre-holographic element comprising the steps of:

a. providing a poly (methyl methacrylate) base;

b. coating the base with a coating composition made up of 2 weight percent nitrocellulose and 98 weight percent 2-methoxyethanol;

c. drying the coating

d. denitrating the coating by immersing it in a stirred bath of a denitrating composition made up of 50 volume percent ammonium sulfide and 50 volume percent ethanol for 1 hour to form regenerated cellulose;

e. covering the coated base with water;

f. placing a pre-hardened gelatin film under the water near the coated base; and

g. removing the water from between the coated base and the gelatin film allowing the gelatin film to contact the coating.

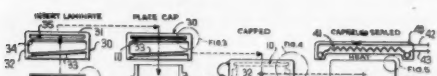
3,928,109
METHOD OF ASSEMBLING AND BONDING A LAMINATED LINER WITHIN A CLOSURE MEMBER

William J. Pollock, Glenview, and Peter Tagaiakis, Chicago, both of Ill., assignors to Phoenix Closures, Inc., Chicago, Ill.

Division of Ser. No. 287,825, Sept. 11, 1972, Pat. No. 3,815,314. This application Nov. 30, 1973, Ser. No. 420,652

Int. Cl.² B29C *27/04*; **B32B** *3/02*; **B65D** *53/04*

U.S. Cl. 156—272 **4 Claims**



1. A prepackaging method comprising the steps of providing a closure having an end panel and a peripheral skirt, providing a liner formed of at least a metallic ply - nonmetallic ply - metallic ply laminate, assembling the liner within the closure with one of the metallic plies proximate the end panel, electrically inductively heating said one metallic ply sufficient to fuse said one metallic ply to the end panel whereby the liner and closure will become fusibly united, and said electrically inductively heating step creates a bond strength between the one metallic ply and the end panel and the nonmetallic ply which is greater than the bond strength between the remaining metallic ply and the nonmetallic ply whereby upon removal of the closure from an associated container the remaining metallic ply will be retained upon the container and separation of the liner will occur between an interface of the nonmetallic ply and the remaining metallic ply.

3,928,110
FILM BONDING USING A SOLVENT SATURATED CLOTH WICK

Richard J. Arconti, Akron, and Robert M. Pierson, Hudson, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 11, 1974, Ser. No. 450,035

Int. Cl.² C09J *5/02*; **B32B** *7/10*, *5/02*

U.S. Cl. 156—308 **2 Claims**

1. In a method for bonding films selected from polyvinylchloride and polyesters, using a solvent, the improvement which comprises:

a. saturating a cloth wick with a solvent capable of rapid interpenetration of the film surface,

b. placing the saturated wick between overlapping edges of the film, and

c. applying pressure until the bond forms,

where said cloth wick is polyvinylchloride when said film is polyvinylchloride, and where said cloth wick is polyester when said film is polyester.

3,928,111
PROCESS OF MAKING A COMPOSITE STRUCTURE OF ISOCYANATE COATED ELASTOMERIC HYDROCARBON AND METAL

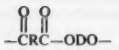
Richard Leroy Baird, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 25, 1974, Ser. No. 436,542

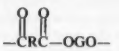
Int. Cl.² C09J *5/02*; **B32B** *31/12*, *25/08*, *15/08*

U.S. Cl. 156—315 **15 Claims**

1. In a process for manufacturing a composite structure of a metal bonded to a cured elastomeric hydrocarbon copolymer containing ethylene units and propylene units, the improvement which consists essentially of coating the surface of the cured elastomeric hydrocarbon copolymer with an organic aromatic polyisocyanate having an —NCO functionality of at least three and wherein the —NCO groups are unhindered and on separate rings, applying an epoxy-based or chlorinated rubber phenolic-based adhesive primer to the surface of the metal to be bonded, and interposing between the polyisocyanate-coated elastomeric surface and the metal-primed surface an adhesive composition, said adhesive composition comprising about 40–100 weight percent of a thermoplastic segmented copolyester having a melt index of less than 150 grams/10 minutes at 200°C. under a 2,160 gram load, and a melting point of at least about 125°C., said copolyester containing 15–75 weight percent short-chain ester units represented by the formula:



and 25–85 weight percent long-chain ester units represented by the formula:



where R is a divalent aromatic radical having a molecular weight of about 76–220, D is a divalent organic radical having a molecular weight of about 28–220, and G is a divalent organic radical having a number-average molecular weight of about 566–3966, and up to about 60 weight percent of a low molecular weight thermoplastic resin which forms compatible mixtures with the segmented copolyester, is thermally stable at 150°C., and has a melt viscosity of less than about 10,000 centipoises at 200°C., applying pressure to the metal and elastomer sufficient to bond them together, thus forming said composite structure.

3,928,112
PROCESS FOR PRODUCING STABILIZED ANATASE TITANIUM DIOXIDE SURFACES FOR DURABLE ADHESIVE BONDING

Willard C. Hamilton, Webster, N.Y., and Raymond F. Wegman, Ledgewood, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 4, 1974, Ser. No. 430,825
Int. Cl.² C23F 7/06; C09J 5/04
U.S. Cl. 156—319 **9 Claims**

1. In the method of adhesive bonding of titanium parts to other parts wherein said titanium parts are subjected, prior to adhesive bonding, to a phosphate-fluoride process to produce anatase titanium dioxide surfaces for adhesive bonding, which process includes (1) an acid pickle bath step, (2) a phosphate-fluoride bath step, and (3) a hot water bath step, and said anatase titanium dioxide surfaces, after being produced, are adhesively bonded to other parts,

the improvement consisting of adding about 2% of a neutral alkali metal sulfate to the bath in any of said three steps for stabilizing the anatase surfaces and thereby preventing transformation thereof to the undesired rutile structure.

3,928,113
METHOD FOR COATING HUMAN NAILS

Ira Rosenberg, West Norwalk, Conn., assignor to Clairol Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 370,071, June 14, 1973. This application Oct. 24, 1973, Ser. No. 409,359
Int. Cl.² A61K 7/043; B05D 3/06
U.S. Cl. 156—344 **41 Claims**

1. A method for coating human nails with compositions that are adopted to be readily removable from the nails by soaking the nails in water which comprises:

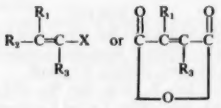
a. applying to said nails a liquid basecoat composition containing a water-soluble or water-swellable flexible film forming polymer;

b. allowing said composition to dry on said nails whereby a film of said water-soluble or water-swellable polymer is deposited on and adheres to said nails;

c. applying to said dried film of water-soluble or water-swellable polymer a second layer of liquid photocurable nail lacquer composition capable of being polymerized by an actinic light source; and

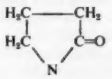
d. exposing said layer of photocurable nail lacquer composition to a source of actinic light for a sufficient period of time to cure said nail lacquer composition whereby a hard polymerized layer of nail lacquer is obtained which overlies and adheres to said basecoat layer;

said water-soluble or water-swellable polymer being a polymerization product of one or more vinylic compounds of the formula:



in which:

(i). R_1 is hydrogen, alkyl, phenyl, halide or pyrrolidonyl



(ii). R_2 is hydrogen, alkyl, phenyl, halide or -COOH;

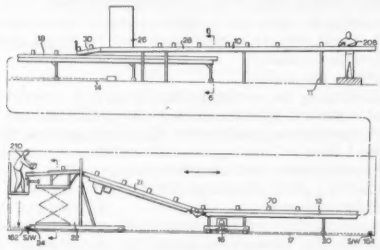
(iii). R_3 is hydrogen, alkyl, carboxyalkyl, phenyl or halide;

(iv). X is hydrogen, —COO alkyl, COOH, —O alkyl, —CN or halide.

3,928,114
APPARATUS FOR BUILDING OF STRUCTURAL COMPONENTS

Norman N. Aylon, Willowdale, Canada, assignor to General Concrete of Canada Limited, Hamilton, Canada

Filed Mar. 26, 1974, Ser. No. 454,792
Int. Cl.² E04G 21/00; E04B 1/00; B65G 37/00; B32B 31/12
U.S. Cl. 156—351 **11 Claims**



1. An apparatus for use in the building of structural components which comprises:

first longitudinally extending conveyor means having a building block conveying surface and a discharge end, said first conveyor means having a substantially fixed position;

second longitudinally extending conveyor means having a building-block conveying surface and a discharge end and being situated to receive building blocks from said discharge end of said first conveyor means,

fixed location track means extending in the same longitudinal direction as said first conveyor means,

first-mounting means mounting said second conveyor means on said track means for movement longitudinally thereof and longitudinally of said first conveyor means to provide a variable portion of said second conveyor means vertically below said first conveyor means,

adhesive applying means located in substantially fixed position adjacent to and upstream from said discharge end of said first conveyor means for applying adhesive to selected portions of selected surfaces of building blocks situated on said first conveyor means prior to discharge of the same to said second conveyor means;

platform assembly means located at said discharge end of said second conveyor means and articulated thereto for

receiving building blocks therefrom, second mounting means mounting said platform means on said track means for movement of said platform means with said second conveyor means on said track means, stop means located at said discharge end of said first conveyor means for selectively preventing and allowing discharge of a block from said first conveyor means to said second conveyor means,

first and second block sensing means longitudinally spaced apart from each other and located adjacent said second conveyor means for sensing the presence of blocks thereon, said first and second block sensing means being located in fixed positions spaced from and downstream of said discharge end of said first conveyor means with said first block sensing means being spaced a distance from said discharge end of said first conveyor means which is greater then said second block sensing means,

said first block sensing means actuating the opening of said first stop means to allow passage of a block from said first conveyor means to said second conveyor means when a block conveyed on said second conveyor means passes said first sensing means,

said second block sensing means actuating the closure of said first stop means when a block conveyed on said second conveyor means passes said second sensing means,

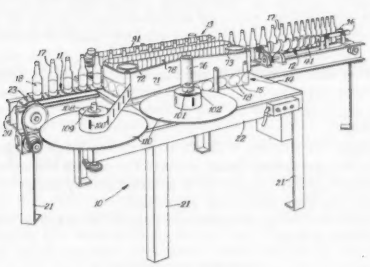
at least one panelization frame on which said structureal unit is to be built situated in substantially fixed position adjacent said platform assembly means and extending in the longitudinal direction of said first and second conveyor means; and

drive means for simultaneously longitudinally moving said second conveyor means and platform assembly means on said track means relative to said fixed location first conveyor means, first and second block sensing means and at least one panelization frame.

3,928,115
MACHINE FOR TRANSFERRING INDICIA TO CYLINDRICAL ARTICLES

Daniel Kerwin, Lombard, Ill., assignor to The Meyercord Co., Carol Stream, Ill.

Filed Oct. 9, 1973, Ser. No. 404,300
Int. Cl.² B65C *3/16*
U.S. Cl. 156—363 **14 Claims**

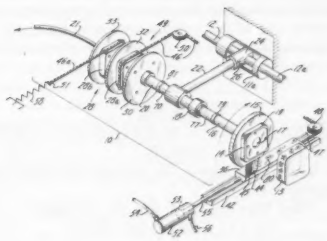


1. Apparatus for applying indicia to a succession of generally cylindrical articles while the articles are in movement, the indicia being removably attached to an elongated web and being sequentially spaced on said web at fixed intervals, comprising conveyor means for moving a series of articles sequentially along an article transport path, means for moving an indicia carrying web along a web transport path, a portion of said web transport path extending parallel to and adjacent said article transport path, means for turning articles while the articles are moving on said article transport path to cause said articles to roll along said web and against said indicia to peel said indicia from said web, means for spacing said articles on said article transport path, and sensor means responsive to the relative positions of said indicia and said articles for automatically actuating said spacing means during operation of said apparatus to adjust the spacing of said articles while maintaining substantially constant the speed of movement of said web. **8.** A machine comprising an indicia transferring mechanism, means for moving a web through the mechanism, the web having indicia thereon at fixed intervals, means for moving cylindrical articles through said mechanism at spaced intervals, said mechanism including means for rolling each article along said web and across an indicium to peel an indicium from said web and thereby attach the indicia to the articles, and automatic means for adjusting the spacing between adjacent articles during operation of said machine and while maintaining substantially constant the speed of movement of said web in order to properly time the entrance of said articles and said indicia into said mechanism.

3,928,116
AUTOMATIC DECAL APPARATUS

Albert J. Wahl, Fredonia, N.Y., assignor to Commercial Decal, Inc., Mount Vernon, N.Y.

Filed Mar. 12, 1974, Ser. No. 450,295
Int. Cl. B65c *3/10*
U.S. Cl. 156—447 **10 Claims**



1. Apparatus for transferring decalcomanias to objects to be decorated therewith; said apparatus comprising:

a frame;

first means rotatably mounted on said frame for holding an object to be decorated, said object having a predetermined shape;

second means movably mounted on said frame with respect to said first means for holding a decalcomania in releasable position;

third means for reciprocally moving said second means with respect to said first means whereby said decalcomania will be passed in transfer relation to said object; and

fourth means connected between said first means and said second means for rotating said first means in direct response to movement of said second means, said fourth means comprising a cam having said predetermined shape of said object, said cam being mounted for rotation with said first means, and connecting means having a first portion connected to said second means and a second portion wrapped about said cam, whereby the velocity of said periphery of said object will correspond to the velocity of said second means.

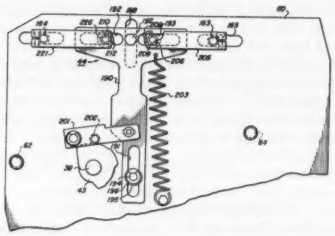
3,928,117
T-BAR ACTUATED BOOKBINDER

Ernest J. Sarring, Mundelein, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,510
Int. Cl.² B42C *13/00, 19/00*
U.S. Cl. 156—477 B **8 Claims**

1. Apparatus for applying an adhesive bearing substrate to a stack of sheets, comprising:

a. rotatable bipartite clamping means;
b. means for biasing the clamping means into abutment with the stack of sheets, whereby the stack of sheets are compressed and held;
c. means for supporting the substrate with its adhesive bearing side facing an edge of the stack of sheets;

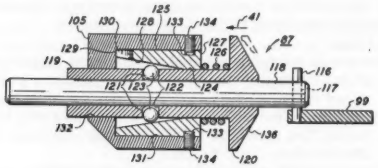


d. an arrangement of platens;
e. means for rotating the clamping means to linearly drive the stack of sheets against the adhesive bearing side of the substrate and to move the other side of the substrate against at least one of the platens; and
f. means for biasing the platens in the arrangement against said other side of the substrate, thereby fixing the adhesive bearing substrate to the stack of sheets to form a book.

3,928,118
BOOKBINDER HAVING ROTATABLE CLAMPING MEANS

Richard J. Kuhns, Barrington, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,840
Int. Cl.² B42C *13/00, 19/00*
U.S. Cl. 156—477 B **10 Claims**

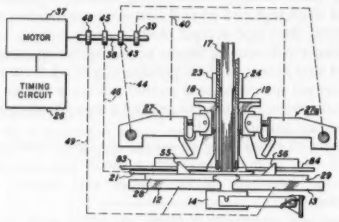


1. Apparatus for applying an adhesive bearing substrate to a stack of sheets, comprising:
a. rotatable bipartite clamping means, one of the parts including a first rod rotatably mounted on a frame, a first bracket rotatably mounted on the rod, a first plurality of drivers mounted on the bracket, and first means for elastically driving the bracket, the other one of the parts including a second rod rotatably mounted on the frame, a second bracket rotatably mounted on the second rod, a second plurality of drivers mounted on the second bracket, and second means for elastically driving the second bracket;
b. means for biasing said first and second plurality of drivers into abutment with the stack of sheets, whereby the stack of sheets are compressed and held;
c. means for supporting the substrate with its adhesive bearing side facing an edge of the stack of sheets;
d. an arrangement of platens;
e. means for rotating said first and second rod to linearly drive the stack of sheets against the adhesive bearing side of the substrate and to move the other side of the substrate against at least one of the platens; and
f. means for biasing the platens in the arrangement against said other side of the substrate, thereby fixing the adhesive bearing substrate to the stack of sheets to from a book.

3,928,119
BOOKBINDING MACHINE

Ernest J. Sarring, Mundelein, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,841
Int. Cl.² B42C *13/00, 19/00*
U.S. Cl. 156—477 B **11 Claims**



1. Apparatus for applying a piece of adhesive strip to a stack of sheets having a thickness within one of several thickness ranges, the width of the adhesive strip to be applied being dependent on the thickness range to which the thickness of the stack of sheets corresponds, comprising:
a. a frame;
b. a pair of support plates movably mounted to the frame;
c. a pair of caliper members, each member being coupled to a different one of the support plates;
d. means for moving the support plates to bring the caliper members toward each other until they compress with a predetermined force a stack of sheets to be bound;
e. releasable clutch means for preventing movement of the support plates away from each other as soon as the stack of sheets has been compressed with said force;
f. a pair of strip guides, each strip guide being coupled to a different one of the support plates;
g. means, responsive to the distance between the clutched support plates, for moving the strip guides into position for supporting a piece of adhesive strip which is of suitable width for binding an edge of the stack of sheets;
h. a pair of platens facing each other, each of the platens being slidably mounted on a different one of the support plates, the maximum distance between the facing platens being determined by the distance between the support plates;
i. means for driving, with an edge of the stack of sheets, against the spaced facing parts of the platens the adhesive strip supported by the strip guides, thereby snugly wrapping the strip about said edge; and
j. means for fixing the adhesive strip to the stack of sheets to form a book.

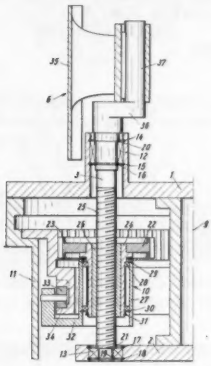
3,928,120
APPARATUS FOR SEPARATING AND CONVEYING SHEET-LIKE BLANKS

Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed Apr. 30, 1974, Ser. No. 465,648
Claims priority, application Germany, May 18, 1973, 2325244
Int. Cl.² B65C *9/16;* **B65H** *3/20*
U.S. Cl. 156—568 **5 Claims**

1. An apparatus for treating a plurality of sheet-like blanks in a succession of stations, such as applying gum to a removal member mounted on a support, picking up a label from a pile

with said removal member and delivering the label to another station, comprising first means for rotating said support on a support axis and second means for rotating said removal member about an axis spaced from and parallel to said support axis, a stationary sun gear, an annular pinion, a shaft coaxial with said pinion and having an axis located so that the pinion meshes with the sun gear, threads connecting the inside of said annular pinion with said shaft to cause them to rotate together, the removal member being operatively connected to said shaft so as to be rotated together therewith about the axis



of said shaft due to engagement of said pinion with said sun gear as rotation of said support carries said removal member past the successive stations, a stationary cam extending past all the stations, a cam follower engaging said cam, said follower being operatively connected with said pinion so as to displace said pinion vertically in dependence on said cam configuration, vertical displacement of said pinion increasing or decreasing the rotational speed of said shaft and its removal member about the axis of said shaft due to the threaded connection between said pinion annulus and said shaft.

3,928,121
PROCESS FOR THE OBTENTION OF FERMENTABLE POWDERED SYRUP AND ALPHACELLULOSE FROM XEROPHYTE PLANTS

Enrique Zepeda-Castillo, Juan Bernardino 249, Guadalajara 5, Jal., Mexico

Filed Oct. 23, 1974, Ser. No. 517,575
Claims priority, application Mexico, Oct. 23, 1973, 146945
Int. Cl.² D21C *3/00, 5/00;* **A23L** *1/28, 2/08, 2/30*
U.S. Cl. 162—14 **10 Claims**

1. A process for the obtention of fermentable powdered syrup and alpha-cellulose from xerophyte plants which comprises: washing the mixed leaf and core material of said plants; chopping the washed plant material to form pieces of a relatively small size and a relatively small amount of plant juice; separating the chopped plant material from the plant juice; extracting the chopped material with an aqueous extractant at a temperature of between 85° and 92°C. to produce an enriched extractant; expressing the extracted residual solid plant material to expel the remaining enriched extractant; hydrolyzing said residual solid plant material by treatment with water at a temperature of about 100°C. to 120°C.; expressing the hydrolyzed plant material to expel a hydrolysis liquor to be incorporated into said aqueous extractant; admixing said plant juice and said enriched extractant in order to obtain a mixed juice and subjecting the residual solid plant material to digestion, bleaching, washing, drying and sifting to obtain alpha-cellulose; settling, clarifying and filtering said mixed juice to remove the impurifying solids; heating the juice to a temperature of about 100°C.; concentrating said juice by evaporation to produce a juice having a Brix degree of about 80, whereby a highly concentrated syrup is obtained; and drying said syrup to obtain a fermentable powdered syrup which is hygroscopic, but highly stable when packed in air-proof reservoirs.

3,928,122
PAPER CONTAINING A UREA-FORMALDEHYDE PIGMENT

Darrell J. L. Griffiths, State College, Pa., and Denis K. Huang, Laurel, Md., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 320,834, Jan. 3, 1973, Pat. No. 3,849,378. This application Aug. 23, 1974, Ser. No. 499,928
Int. Cl.² D21H *3/52*
U.S. Cl. 162—166 **1 Claim**

1. Paper comprising cellulose fibers and an amount of a bright, white and opaque precipitated urea formaldehyde pigment sufficient to increase the B&L Opacity of a control sheet having an opacity of about 70 without said pigment by about 12 points when the furnish for making said paper is provided with about 10 percent by weight of said pigment, said precipitated urea formaldehyde pigment being in the form of flakes having an average particle size of about 0.1 to 0.5 micron distributed in an agglomerated structure ranging from about 3 to 6 microns in size, and having a scattering coefficient ranging from about 0.42–0.52 and produced in slurry form by:

a. selecting a urea formaldehyde resin that has been reacted at least to its water insoluble stage, said resin having a water tolerance of from about 1.5 to 5.0 and a viscosity of at least about 450 cps. at 50 percent solids;
b. precipitating said resin in an aqueous precipitating bath containing from about 0.125 to 1.5 percent by volume of a strong mineral acid catalyst at a temperature of from about 20°–95° C., under agitation, at a resin to water ratio of from about 1/16 to ⅜, by adding said resin to the precipitating bath in controlled amounts over a period of time ranging from about 15 minutes to one hour to form the precipitated urea formaldehyde pigment in said slurry form; and,
c. reacting the mixture of resin and precipitating bath for an additional period of time to insure a total reaction time of from about ½ to 5 hours before collecting the precipitated pigment product in said slurry form and homogenizing the product to the stated particle size.

3,928,123
PULP DIGESTER VENT SYSTEM

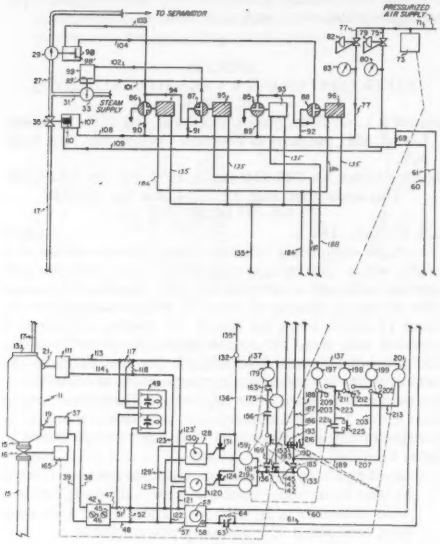
Robert E. Marks, Belleair, Fla., assignor to Envirotech Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 294,421, Oct. 2, 1972, now Defensive Publication No. 3,817,824. This application June 17, 1974, Ser. No. 480,193
Int. Cl.² D21C *7/12*
U.S. Cl. 162—238 **18 Claims**

12. A system for controlling the venting of gases and vapors from a batch-type pulp digestion vessel comprising:

a. a selectively positionable relief valve connected in communication with the digestion vessel for venting vapors and gases therefrom;
b. means for continuously measuring the pressure in the digestion vessel;
c. means coupled to said pressure measuring means for generating first signals representative of the measured pressures in the digestion vessel;
d. positioning means associated with said relief valve and connected to receive said representative signals from said first signal generating means for adjusting the opening of said relief valve proportionately and in response to said first signals, said relief valve being disposed for opening to a maximum when the pressure within the digester is at a minimum, as reflected by said representative signals,

and for continuously throttling said relief valve toward a pre-selected restricted position as the pressure within the



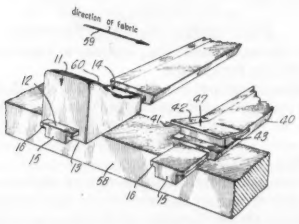
digester increases, as reflected by the amplitude of the representative signals, to a value corresponding to a pre-selected pressure in the digestion vessel.

3,928,124

FABRIC EDGE CURLER MEMBER FOR A PAPER MACHINE

Victor Emanual Hansen, 7704 Wildwood Way, Jacksonville, Fla. 32216

Filed Feb. 19, 1974, Ser. No. 443,735
Int. Cl.² D21F *1/24*
U.S. Cl. 162—274 **9 Claims**



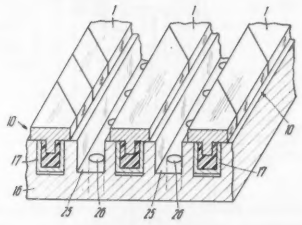
1. A curling member for curling the outside edge of a forming fabric of a paper making machine with said fabric supported on foil blades mounted on support rails, said curling member having an upper, substantially flat fabric support surface, said fabric support surface having rounded side edges extending transversely to the direction of travel of said forming fabric, said support surface having a lower end lying at the level of or slightly below the horizontal plane of said fabric and curving upwardly outward a distance sufficient to support and impart an upward curvature to a portion of the outside edge of said forming fabric, and a recess in an underface of said curling member for tight sliding fit of said curling member on an end portion of a respective one of said support rails, said sliding fit providing adjustment of said curling member transversely to the axis of travel of said fabric to obtain a desired up-curl in a side edge of said fabric.

3,928,125

WATER EXTRACTION APPARATUS FOR PAPERMAKING MACHINE

Rudolf Poeschl, Vienna, Austria, assignor to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf-Oberkassel, Germany

Filed Dec. 13, 1973, Ser. No. 424,197
Claims priority, application Austria, Dec. 18, 1972, 10796/72; July 2, 1973, 5820/73
Int. Cl.² D21F *1/48*
U.S. Cl. 162—352 **9 Claims**



1. A contact unit for a paper-making machine and the like comprising:

a. an elongated channel member having a web part and two flange parts extending from said web part in a common direction,
   1. said parts jointly bounding a cavity open in said direction,
   2. respective free end portions of said flange parts defining therebetween the open side of said cavity;

b. an elongated contact body constituted by a plurality of elongated contact sections of a material having a hardness greater than 6 on the Mohs scale,
   1. said sections being abuttingly juxtaposed in the direction of elongation of said body and having respective top faces located in a common longitudinal plane,
   2. each section having two longitudinal bottom face portions transversely spaced from each other,
   3. each bottom face portion engaging a respective one of said free end portions in direct contact and partly projecting from the engaged free end portion toward the other bottom face portion,
   4. the projecting part of each bottom face portion facing inward of said cavity;

c. a body of bonding material filling said cavity in contact with said channel member and said projecting parts; and

d. a longitudinally elongated, integral rib projecting from one of said bodies and separating said bottom face portions, the other body being formed with a longitudinal groove conformingly receiving said rib.

3,928,126

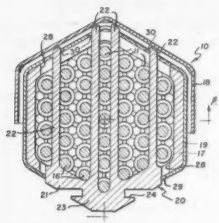
FUEL OR IRRADIATION SUBASSEMBLY

Orville S. Seim, Wheaton, and Ernest Hutter, Wilmette, both of Ill., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,787
Int. Cl.² G21C *3/02*
U.S. Cl. 176—15 **10 Claims**

1. A subassembly for use in a nuclear reactor comprising a bundle of parallel pins incorporating nuclear fuel or a material to be irradiated enclosed within a coolant tube having an annular undercut portion in the lower portion of the coolant

tube, an inner tube within said coolant tube and surrounding said bundle of pins, a coolant tube surrounding said inner tube, and a locking comb consisting of a head and a plurality



of elongated teeth extending through slots in said inner tube and engaging said undercut portions of said pins to restrain the pins from movement.

3,928,127

METHOD FOR DETERMINING RAPID DENSITY FLUCTUATIONS OF NUCLEAR REACTOR COOLANTS

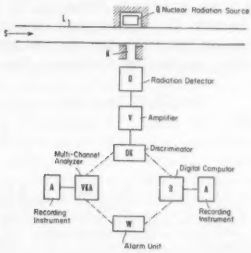
Sigwart Hiller, Lauf, Pegnitz, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 6, 1973, Ser. No. 394,754

Claims priority, application Germany, Sept. 29, 1972, 2247745

Int. Cl. G21c *17/02*

U.S. Cl. 176—19 R **3 Claims**



1. A method for determining rapid density fluctuations of a nuclear coolant flowing in a pipe by irradiating the coolant by a nuclear radiation source and detecting differences in the absorption of the radiation by the coolant; wherein the improvement comprises detecting unabsorbed radiation transmitted through the coolant flow to produce electric signals which are amplified and shaped into standardized pulses of equal amplitude, said pulses being stored at successive time intervals of short duration.

3,928,128

METHOD FOR ERECTING AND OPERATING AT LEAST TWO NUCLEAR REACTORS

Walter Kollmar; Hans Märkl, and Klaus Thieme, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 28, 1973, Ser. No. 374,315

Claims priority, application Germany, July 26, 1972, 2236780

Int. Cl. G21c *19/20*

U.S. Cl. 176—30 **7 Claims**

1. Method for erecting and operating at least two light-water nuclear reactors which are substantially identical to each other and with reactor cores which comprise several groups of fuel elements with identical outside dimensions but different concentrations, and which elements each comprise an assembly of fuel rods; characterized by the feature that the first nuclear reactor is erected and operated for the duration of at least one fuel element cycle, and that the second nuclear reactor is erected and completed after the end of the fuel element cycle of the first reactor, and is then equipped with a reactor core which consists 10 to 50%, and preferably 20 to 40%, of unchanged fuel elements of the first nuclear reactor, which have been burned down during one fuel element cycle.

3,928,129

NUCLEAR REACTOR ELEMENT

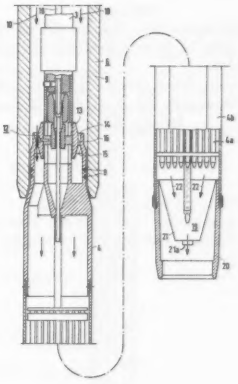
Claus Goetzmann, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 10, 1973, Ser. No. 387,249

Claims priority, application Germany, Aug. 31, 1972, 2242933

Int. Cl. G21c *9/00*

U.S. Cl. 176—38 **3 Claims**



1. A gas-cooled nuclear reactor fuel element comprising a bundle of nuclear fuel rods having metal casings having maximum safe operating temperatures, an elongated tubular gas-coolant duct radially enclosing said bundle, said duct having an inlet end for gas coolant, an adjustable gas-coolant flow choke for said inlet end, said duct having an outlet end for gas coolant heated by said fuel rods when said element is operating, and a non-adjustable static gas-coolant flow choke for said outlet end and connected to said outlet end by metal having a melting temperature substantially lower than said maximum safe operating temperature of said metal casings of said fuel rods.

3,928,130

SHEATH FOR NUCLEAR FUEL ELEMENTS

John Pawliw, Peterborough, and Jarda Zabrodsky, Ottawa, both of Canada, assignors to General Electric Company, San Jose, Calif.

Filed June 19, 1973, Ser. No. 371,374

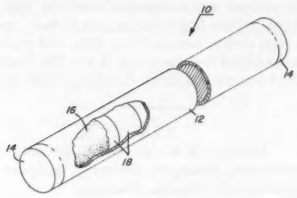
Claims priority, application Canada, Sept. 27, 1972, 152613

Int. Cl. G21c *3/04*

U.S. Cl. 176—67 **8 Claims**

1. A nuclear fuel element which comprises an elongated cylindrical metallic container, a column of nuclear fuel material disposed in and partially filling said container thus leaving an internal cavity at one end of said container, an end plug secured and sealed at each end of said container, a fuel column retaining member positioned in said cavity, and a non-metallic sheath in wrapped relation with said column of said

fuel material to contain at least a portion of the mechanical loads acting on said element during nuclear fission, said sheath



being formed of fibrous material selected from the group of carbonaceous and boron filaments of high strength.

3,928,131

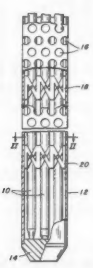
GRID STRUCTURE FOR NUCLEAR REACTOR FUEL ASSEMBLY

William J. Wachter, 3157 Bel Air Drive, Pittsburgh, Pa. 15227, and John G. Akey, 630 Garden City Drive, Monroeville, Pa. 15146

Continuation-in-part of Ser. No. 850,113, Aug. 14, 1969, abandoned. This application Oct. 24, 1972, Ser. No. 300,137

Int. Cl. G21c *3/30*

U.S. Cl. 176—78 **10 Claims**



1. In a grid structure for a nuclear reactor fuel assembly, a plurality of slotted members interconnected to each other to form an egg-crate assembly having openings through which elongated fuel elements extend, each of said openings being bounded by corners formed from vertical portions, and at least two cross straps at each side of each of said openings, said cross straps interconnecting said vertical portions and being disposed at an acute angle with respect to the vertical axes of said vertical portions whereby the flexibility of said cross straps is increased for a given fuel element diameter, each cross strap extending from the top of one vertical portion to the bottom of an adjacent vertical portion in a slotted member.

3,928,132

ANNULAR FUEL ELEMENT FOR HIGH-TEMPERATURE REACTORS

Roko Bujas, Gif-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

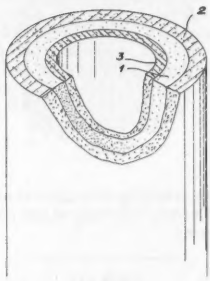
Continuation-in-part of Ser. No. 245,622, April 19, 1972, abandoned. This application Sept. 28, 1973, Ser. No. 401,960

Claims priority, application France, Apr. 29, 1971, 71.15372

Int. Cl. G21c *3/06*

U.S. Cl. 176—83 **2 Claims**

1. A compacted fuel element for a high-temperature reactor, said fuel element of annular shape being enclosed within an annular graphite casing constituted by an outer graphite tube and an inner graphite tube, wherein the inner tube is



formed of a graphite having a lower coefficient of shrinkage under irradiation of the fast neutrons produced in the reactor than the graphite of the outer tube.

3,928,133

BIOLOGICAL SHIELD FOR A NUCLEAR REACTOR

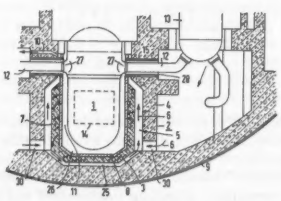
Hans-Peter Schabert, Erlangen; Johann Ropers, Grossdechsendorf, and Erich Strickroth, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 24, 1973, Ser. No. 354,000

Claims priority, application Germany, May 26, 1972, 2220486

Int. Cl. G21c *11/08*

U.S. Cl. 176—87 **25 Claims**



1. In a nuclear reactor equipped with a reactor pressure vessel made of steel and a concrete biological shield surrounding the reactor pressure vessel, said shield comprising an inner shield part surrounding the reactor pressure vessel and an outer shield part disposed around and concentric to said first shield part, said inner and outer shield parts conjointly defining a gap therebetween, cooling medium supply means communicating with said gap for circulating a cooling medium therethrough, said reactor pressure vessel and said inner part conjointly defining an intermediate space therebetween, means for closing off said intermediate space from said gap, said nuclear reactor including a containment shell enclosing said biological shield and said reactor pressure vessel, said cooling medium being air, and said cooling medium supply means comprising discharge means for conducting the air away from said gap and into the atmosphere of said containment shell, said inner shield part having a wall thickness of at least 20cm.

3,928,134

MICROBIOLOGICAL REDUCTION OF 7-(2(3-HYDROXY-1-OCTENYL)-5-OXO-3-CYCLOPENTEL-1-YL)-5-HEPTENOIC ACID AND RELATED COMPOUNDS

George Greenspan, Narberth, Pa., and Michael R. G. Leeming, Canterbury, England, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 420,406, Nov. 30, 1973, abandoned. This application Oct. 23, 1974, Ser. No. 517,126

Int. Cl.[2] C12D *1/02*

U.S. Cl. 195—30 2 Claims

1. A process for the preparation of 7-(2-[(3R)-3-hydroxy-1-octenyl]-5-oxo-cyclopentyl)-5-heptenoic acid which comprises:

a. incubating 7-(2-[(3R)-3-hydroxy-1-octenyl]-5-oxo-3-cyclopenten-1-yl)-5-heptenoic acid; or its methyl ester, acetate with a fungus of the species *Corynespora cassiicola;* and

b. isolating the reduced acid product.

3,928,135

PROCESS FOR THE PRODUCTION OF GLUCOSE POLYMERS

Jeremiah Milner, 41, N. John St., Liverpool, L2 6SE, England

Filed May 2, 1973, Ser. No. 356,550

Claims priority, application United Kingdom, May 2, 1972, 20320/72

Int. Cl.[2] C12D *13/02*

U.S. Cl. 195—31 R 13 Claims

1. Process for the production of glucose polymers which comprises

a. hydrolysing starch containing no more than 20% of amylopectin by means of an α -amylase enzyme is a buffer solution at a pH of about 6.5,

b. heating the resulting mixture in solution to a sufficiently elevated temperature to destroy the enzyme, stopping the hydrolysis reaction when the glucose level rises to about 3% by weight of the total dextrins,

c. removing electrolytes by passing the mixture through a ion-exchange resin or by making a solution of the mixture in water adding an alcohol to form a dextrin precipitate leaving the electrolyte in solution, dissolving the precipitate in aqueous alcohol and distilling off the alcohol,

d. boiling the solution to reduce pyrogens,

e. passing the solution through a candle or Seitz filter to remove bacterial and unwanted protein substances,

f. removing glucose by dialysis or by means of a dextran resin column, and

g. removing the long chain dextrins by fractionation with alcohol and thereafter recovering glucose polymers in which glucose units in the polymers linked in the 1,6-position constitute no more than 5% of the total linkages.

3,928,136

CONTAINER FOR COLLECTION OF CULTURES OF PARASITIC FUNGI AND A METHOD OF USING THE SAME

Pierre A. Launey, 9, rue des Canettes, 75006 Paris, France

Filed Oct. 16, 1973, Ser. No. 406,885

Claims priority, application France, Oct. 26, 1972, 72.37979

Int. Cl.[2] C12B *1/00*

U.S. Cl. 195—54 9 Claims

1. A container for the collection of cultures of parasites of a fungal nature, comprising a vessel and a cover, both constituted of transparent material, said vessel comprising a body having a flat face, said body having an elongated chamber of semicylindrical cross-section which is open at said flat face, said body including opposite side walls, between which the chamber is disposed, said side walls extending from said flat face in the same direction as said chamber and over a distance greater than the depth of the chamber, said cover being constructed to cover the flat face of the vessel and to be hermetically joined to the vessel.

8. A method of using containers according to claim 1, to form a collection of parasites of a fungal nature, comprising placing a necessary amount of agar in the chamber of the vessel of each container;

seeding a fungal parasite in the agar and allowing it to develop to the desired stage;

placing the open container in a heated environment at 30°C for 3 hours;

closing the container with said cover in an atmosphere of dry air at 30°C;

sealing the cover of the container; and

subjecting the container and the parasite to a flux of gamma rays from a radioactive source.

3,928,137

REAGENT FORMULATION FOR URIC ACID ASSAY

Alexander A. Monte, and Ching Chiang, both of Glendora, Calif., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 200,552, Nov. 19, 1971, Pat. No. 3,816,262, which is a continuation-in-part of Ser. No. 190,883, Oct. 20, 1971, abandoned. This application May 6, 1974, Ser. No. 467,431

Int. Cl.[2] G01N *31/14, 33/16*

U.S. Cl. 195—63 5 Claims

1. An enzyme reagent formulation for use in assaying a biological specimen for uric acid comprising a granular, water-soluble, anhydrous, storage-stable mixture containing:

a. uricase;

b. potassium chloride;

c. mannitol;

d. gum acacia;

e. bovine serum albumin;

f. glycine;

g. sodium carbonate; and

h. a nitrogen-containing polyoxyalkylene nonionic surfactant obtained by the sequential reaction of ethylenediamine with propylene oxide and ethylene oxide in the presence of a catalyst, said surfactant containing polyoxypropylene chains having an average molecular weight of between about 750 and 6750 and polyoxyethylene chains constituting between about 10 and about 80 weight percent of said surfactant.

3,928,138

PREPARATION AND USE OF ENZYMES BOUND TO POLYURETHANE

Louis L. Wood, Rockville; Frank J. Hartdegen, and Peter A. Hahn, both of Columbia, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 404,823, Oct. 9, 1973, which is a continuation-in-part of Ser. No. 250,012, May 3, 1972, abandoned. This application May 21, 1973, Ser. No. 362,488

Int. Cl.[2] C07G *7/02*

U.S. Cl. 195—68 5 Claims

1. The method of preparing a bound enzyme that includes contacting, prior to a subsequent foaming step, an isocyanate-capped polyurethane with an aqueous dispersion of an enzyme, under foam-forming conditions, whereby the polyurethane foams and the enzyme becomes integrally bound to the thus formed polyurethane foam.

3,928,139
DETECTION OF MICROBIAL PATHOGENS

Gordon L. Dorn, Dallas, Tex., assignor to J. K. & Susie L. Wadley Research Institute & Blood Bank, Dallas, Tex.

Continuation-in-part of Ser. No. 331,693, Feb. 12, 1973, abandoned. This application Nov. 9, 1974, Ser. No. 428,135
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **47 Claims**

1. In a method of detecting the presence of microbial pathogens wherein a sample of body fluid is obtained and subjected to analysis for microbial pathogens the improvement comprising: concentrating said microbial pathogens contained within said body fluid and separating said microbial pathogens from the residual of said body fluid after said body fluid is obtained and before said analysis by the method comprising:

a. depositing said sample of body fluid on a liquid filter medium in a confined sterile zone, said liquid filter medium being nontoxic to said microbial pathogens and having a density greater than said sample of body fluid and thereby able to support said body fluid and selectively receive said pathogens from said body fluid;

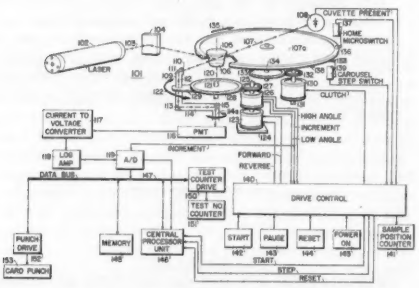
b. subjecting said confined zone to centrifugation thereby forcing said sample of body fluid against said liquid filter medium and causing substantially all of said microbial pathogens to selectively pass therein and thereby separate from the residual mass of said sample of body fluid; and

c. separating said liquid filter medium containing substantially all of said microbial pathogens from contact with said residual mass of said sample fluid.

3,928,140
APPARATUS AND PROCESS FOR TESTING MICROPARTICLE RESPONSE TO ITS ENVIRONMENT

Philip J. Wyatt, 1939 Laguna St., Santa Barbara, Calif. 93101; Vincent R. Stull, 1526 Monte Vista Road, Santa Barbara, Calif. 93103; William L. Proctor, 6641 Del Playa, Goleta, Calif. 93017, and Irving L. Miller, 129 York St., No. 5B, New Haven, Conn. 06511

Filed May 10, 1974, Ser. No. 468,992
Int. Cl.² C12K *1/04*
U.S. Cl. 195—103.5 R **43 Claims**



1. Process for testing the response of a microparticle to its environment, comprising the steps of:

A. preparing a microparticle control sample;

B. inserting said sample into the path of an incident narrow, substantially monochromatic beam of radiant energy;

C. measuring the intensity of radiant energy scattered by said sample at a plurality of angular locations about said sample relative to the direction of said incident beam sufficient to derive a control differential scattering pattern produced by said sample;

D. preparing a microparticle test sample by introducing a selected environmental change relative to said control sample;

E. inserting said test sample into said beam path;

F. measuring the intensity of radiant energy scattered by said test sample at substantially the same said angular locations about said test sample to derive a test differential scattering pattern produced by said test sample;

G. effectively shifting said test pattern along a selected axis relative to said control pattern until the algebraic sum of the areas between said patterns is a minimum; and

H. comparing said control and said shifted test patterns to determine a selected relative difference therebetween, said difference providing an indication of the response of said microparticle to said selected environmental change.

3,928,141
METHOD AND APPARATUS FOR NITROBLUE TETRAZOLIUM (NBT) TESTS FOR CHRONIC GRANULOMATOUS DISEASE AND RELATED SYNDROMES

Zenon Sosnowski, Winnipeg, Canada, assignor to International Diagnostic Products Ltd., Winnipeg, Canada

Filed Mar. 6, 1975, Ser. No. 555,805
Claims priority, application Canada, Mar. 12, 1974, 194717
Int. Cl.² C12K *1/04*; G01N *31/00*
U.S. Cl. 195—103.5 R **11 Claims**

1. A method for conducting nitroblue tetrazolium tests consisting of the steps of mixing a quantity of nitroblue tetrazolium dye with distilled water, then adding a quantity of dried human plasma and then adding a quantity of heparinzed blood to be tested, letting the results of the mixture incubate at a temperature sufficient to permit incubation, preparing a smear from the mixture, straining the smear in a conventional manner and then counting the P.M.N.-leukocytes having a dark blue deposit.

3,928,142
CULTURE CHAMBER FOR THE STUDY OF BIOLOGICAL SYSTEMS AND METHOD OF FABRICATION THEREOF

Dennis B. Smith, 12016 Rialto St., Sun Valley, Calif. 91352

Filed July 24, 1973, Ser. No. 382,164
Int. Cl.² C12B *1/00*
U.S. Cl. 195—104 **11 Claims**

1. A culture chamber suitable for use in the study of biological systems comprising:

a first and second thin, fragile coverglass,

a gasket of silicone-rubber compound having a peripheral wall with smooth, flat, molded, upper and lower surfaces, said gasket having been cleaned with an organic cleansing agent so that the molded upper and lower surfaces thereof have a natural bonding characteristic which strengthens with time,

whereby said gasket is fully sandwiched between said first and second coverglasses such that the outer edges of the upper and lower surfaces of said gasket are fully supported by said coverglasses, the molded upper and lower surfaces of the peripheral wall of said gasket adhering to the contacting surfaces of said first and second coverglasses to thereby provide a water-tight chamber defined by the opposing surfaces of said coverglasses and the inner surface of the peripheral wall of said gasket, and

wherein the peripheral wall of said gasket is provided with at least one aperture providing access to said chamber and communication with the ambient atmosphere.

7. A method for the fabrication of a culture chamber suitable for use in the study of biological culture systems which comprises:

providing a gasket of silicone-rubber compound having a peripheral wall with smooth, flat, molded, upper and lower surfaces,

forming at least one aperture in the peripheral wall of said gasket,

cleaning the flat, molded, upper and lower surfaces of said gakset with an organic cleansing agent,

providing a first and second thin, fragile coverglass,
cleaning the surfaces of said first and second coverglasses with said organic cleansing agent,
sandwiching said gasket between said first and second coverglasses, said gasket being of such a size that when so sandwiched between said first and second coverglasses the outer edges of the upper and lower surfaces of said gasket are fully supported by said coverglasses,
pressing with moderate finger pressure the surface of said first and second coverglasses against the respective flat, molded, upper and lower surfaces of said gasket to form a continuous area of contact therebetween to thereby provide a liquid-tight chamber defined by the opposing surfaces of said first and second coverglasses and the inner surfaces of the peripheral wall of said gasket, and
permitting the continuous areas of contact of said first and second coverglasses and said gasket to remain in contact for a period of approximately two days to thereby form a strong bond between said gasket and said first and second coverglasses.

3,928,143

METHOD OF CARRYING OUT ENZYME-CATALYZED REACTIONS

Robert W. Coughlin, 902 Seventh Ave., Bethlehem, Pa. 18018

Filed Feb. 23, 1972, Ser. No. 228,748
Int. Cl. C07g *7/02*
U.S. Cl. 195—115 **2 Claims**

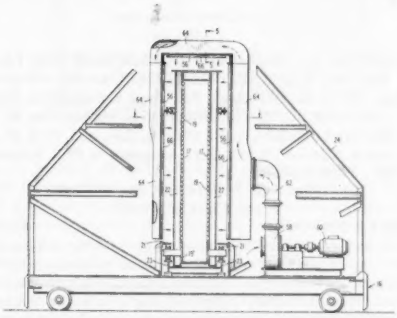
1. A method of carrying out enzymatic reactions using enzymes attached to insoluble, finely divided particles of carrier material which comprises continuously flowing a liquid containing the substrate or reactant upwardly through a reaction zone containing said enzyme-bearing particles and maintaining the vertical liquid velocity within said zone sufficiently high to cause suspension and agitation of said particles but sufficiently low to allow said particles to remain within said reaction zone.

3,928,144

POLLUTANTS COLLECTION SYSTEM FOR COKE OVEN DISCHARGE OPERATION

Christopher C. Jakimowicz, Detroit, Mich., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed July 17, 1974, Ser. No. 489,447
Int. Cl.² C10B *27/00*
U.S. Cl. 202—263 **6 Claims**



1. A coke oven battery air pollution prevention system, in which a transfer car receives the coke discharged from an oven, comprising
a. coke guide means for guiding the coke discharged from an oven into the transfer car,
b. a coke guide carriage carrying the coke guide means for positioning the coke guide means in coke guiding position relative to an oven to be discharged,
c. an exhaust hood carried by the coke guide carriage, the exhaust hood being shaped to enclose the top and sides of the coke guide leaving an open end facing the battery through which end the coke guide projects, the exhaust hood extending outwardly away from the battery and the coke guide carriage to form an enclosure projecting over and enclosing the open top of the transfer car with the downwardly facing open end on the exhaust hood registerable with the open top of the transfer car,
d. means forming an exhaust opening in the exhaust hood above the transfer car,
e. means connectable to means (d) for inducing a draft through means (d) and through the exhaust hood from the open ends of the exhaust hood,
f. a source of air under pressure,
g. duct means associated with the walls of the exhaust hood adjacent the open end of the exhaust hood which faces the battery,
h. conduit means connecting the duct means to the source of air under pressure, and
i. nozzle means communicating with the interior of the duct means, the nozzle means having an outlet orifice shaped to form a curtain of air under pressure on the inside of the open end of the exhaust hood which faces the battery and on each side of the coke guide means, the curtain of air acting to cool and the coke guide means and to cooperate with the means for inducing draft through the exhaust hood to prevent escape of pollutants out of the open end of the exhaust hood.

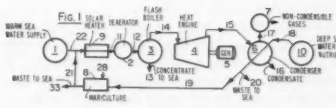
JC R (Solar Energy)

3,928,145

PROCESS FOR PRODUCING POWER, FRESH WATER, AND FOOD FROM THE SEA AND SUN

Donald F. Othmer, 333 Jay St., Brooklyn, N.Y. 11201

Filed Sept. 16, 1974, Ser. No. 506,237
Int. Cl.² B01D *3/00*; **F03G** *7/02*; **A01G** *7/00*
U.S. Cl. 203—11 **24 Claims**

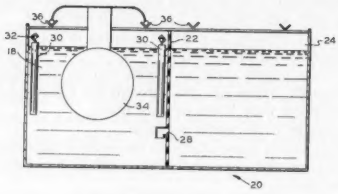


1. The process of preparing sea water for a mariculture operation comprising:
a. supplying heat to a liquid so as to raise its temperature, said heat being derived from solar radiation;
b. flash evaporating said heated liquid in a closed vessel to convert a portion thereof into vapor at a lower temperature and pressure, whereby some of the sensible heat of said liquid is transformed into the latent heat of said vapor;
c. supplying an influent of cold deep sea water substantially free of pollution and of marine life inimical to product fish, but with substantial amounts of nutrients for biologic growth;
d. preheating the deep sea water to raise its temperature to between 55° and 100°F by heat exchange with a major part of said vapor, which is thus condensed; and
e. conveying the preheated deep sea water to said mariculture operation, which produces at least one species of food fish.

3,928,146
ELECTROPLATING RECOVERY PROCESS

James P. Russell, Oregon City, Oreg., assignor to Winter Products Co., Portland, Oreg.

Filed Sept. 6, 1974, Ser. No. 503,631
Int. Cl.² C07B 5/00; A44B 9/12
U.S. Cl. 204—14 R 8 Claims



1. In a plating process wherein articles are plated in a solution within a plating tank and thereafter rinsed in a series of at least three rinse tanks, the improvement comprising,
providing a dual chamber tank having an electrically non-conducting divider therein separating the dual chamber tank into two portions including a plating portion and a rinse portion,
said divider having an opening therein to permit flow of solution between said one portion of said dual chamber tank and the other portion thereof,
plating an article in said one portion of said dual chamber tank,
passing the article from said tank one portion to said plating tank and effecting a plating on said article,
passing the article from said plating tank to the said other portion of said dual chamber tank,
thereafter passing said article seriatum to said rinse tanks, continuously withdrawing solution from the first of said rinse tanks and subjecting it to a first reverse osmosis while continuously passing the concentrate from said first reverse osmosis to a holding tank and the permeate to the second of said rinse tanks,
continuously withdrawing solution from the third of said rinse tanks and subjecting it to a second reverse osmosis while continuously passing the concentrate from said second reverse osmosis to said second rinse tank and the permeate to the final one of said rinse tanks,
and returning solution from said holding tank to said plating tank.

3,928,147
METHOD FOR ELECTROPLATING

Xavier Kowalski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Oct. 9, 1973, Ser. No. 404,562
Int. Cl.² C25D 5/34, 3/12, 3/38
U.S. Cl. 204—29 11 Claims

1. In the method of electroplating die castings composed of zinc or zinc alloyed with at least one of magnesium and aluminum with a less electronegative metal or alloy in a cyanide-free electrolyte comprising an aqueous solution of a complex of said less electronegative metal or alloy and an organophosphorus compound, the improvement which comprises contacting the cathode with an aqueous solution consisting essentially of from about 0.1 percent up to the limit of solubility of an organophosphorus chelating agent for said cathode prior to immersing the cathode in said electrolyte.

3,928,148
COPPER STRIKE BATH AND METHOD FOR COATING ELECTROLESSLY PLATED ARTICLES

Lewis Brian Lerner, Linglestown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 28, 1974, Ser. No. 484,023
Int. Cl.² C25D 3/40, 5/00
U.S. Cl. 204—38 B 6 Claims

2. An aqueous bath for depositing electrolytically a copper strike on an immersed body having a metal deposit thereon, the copper strike bath being at about a pH of 6.8 to 7.2 and consisting essentially of the following components: tetrapotassium pyrophosphate $K_4P_2O_7.3H_2O$ from 90 to 150 grams per liter; (a) potassium cyanide from 4 to 17 grams per liter; and (b) cuprous cyanide, wherein the ratio of a to b is 2:1 to 4:1, by weight.

4. The process as defined in claim 3 wherein the temperature of the bath is from 120° to 140°F and the pH of the bath at 25°C is from 6.8 to 7.2.

3,928,149
WEAK ACIDIC BRIGHT DUCTILE ZINC ELECTROLYTE

Joachim Steeg, Geislingen (Steige), Germany, assignor to Dr.-Ing. Max Schloetter, Geislingen-Steige, Germany

Filed Sept. 11, 1974, Ser. No. 505,065
Claims priority, application Germany, Sept. 18, 1973, 2346942
Int. Cl.² C25D 3/22
U.S. Cl. 204—55 R 15 Claims

1. An aqueous acid zinc plating bath substantially void of ammonium ions for depositing ductile glossy to bright zinc layers within a wide cathodic current density range containing a water-soluble zinc compound capable of plating zinc metal on a substrate, at least about 1 g/l of a polypropoxy ether having a molecular weight of from about 300 to about 1500 and/or a polypropoxy-ethoxy ether having a molecular weight of from about 1,000 to about 5,000 and containing up to about 25% by weight of the polymer of the oxyethylene moiety and an aromatic carbonyl compound.

9. An aqueous acid zinc plating bath for depositing ductile glossy to bright zinc layers within a wide cathodic current density range containing a water-soluble zinc compound capable of plating zinc metal on a substrate and a polypropoxy-ethoxy ether having an approximate molecular weight of between about 1,000 to about 5,000 and containing up to about 25% by weight of the polymer of the oxyethylene moiety, said polymer being present in an amount of at least about 1 g/l.

3,928,150
METHOD OF OPERATING AN ELECTROLYTIC CELL HAVING HYDROGEN GAS DISENGAGING MEANS

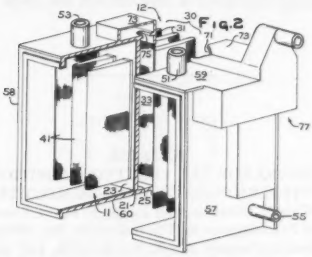
Henry W. Rahn, Pittsburgh, Pa.; Hugh Cunningham, Corpus Christi, Tex.; Colonel R. Dilmore, New Martinsville, W. Va.; Thomas C. Jeffery, Lake Charles, La., and Carl W. Raetzsch, Corpus Christi, Tex., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 2, 1974, Ser. No. 457,299
Int. Cl.² C25B 1/46
U.S. Cl. 204—98 4 Claims

4. In a method of operating an electrolytic cell having a plurality of hollow, finger-like cathodes interleaved between a plurality of anodes and separated therefrom by a permeable barrier, where a sodium chloride brine is fed to the cell and an electrical current is imposed across the cell whereby to evolve hydrogen on the cathodes and chlorine on the anodes and the hydrogen is present within a catholyte chamber of the cell as hydrogen gas having catholyte liquor contained therein, the improvement which comprises:
removing the hydrogen gas having catholyte liquor contained therein from the catholyte chamber of the cell directly to a horizontal channel associated only with the said cell;

transporting the hydrogen gas having catholyte liquor contained therein through the horizontal channel at a velocity in excess of six feet per second;

transporting the hydrogen gas having catholyte liquor contained therein from the horizontal channel against a deflecting baffle, thereby deflecting the gas downwardly directly into a disengaging chamber of increased cross-sectional area associated only with said cell, thereby deflecting the direction of flow thereof and reducing the velocity thereof by a factor of from 0.25 to 0.50 relative to the gas velocity in the horizontal channel;



reversing the direction of flow of the gas and transporting the gas into a chamber of further increased cross-sectional area thereby further reducing the velocity by a further factor of 0.1 to 0.2 relative to the gas velocity in the horizontal channel, and disengaging the catholyte liquor from the hydrogen;

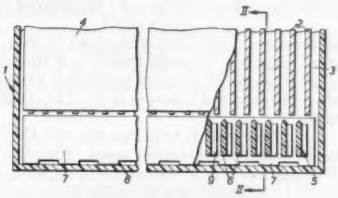
recovering hydrogen gas substantially free of catholyte liquor; and

returning the catholyte liquor directly to said cell.

3,928,151
ELECTROLYTIC REFINING OF COPPER

Colin Walter Nightingale, Formby, and Georg Paul Richard Bielstein, London, both of England, assignors to British Copper Refiners Limited, Prescot, England

Filed Sept. 12, 1973, Ser. No. 396,550
Int. Cl.² C25C 1/12
U.S. Cl. 204—106 **5 Claims**



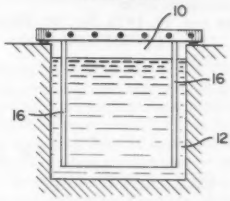
1. A method of electrolytically refining copper by the series process which comprises forming a copper strip of indefinite length by a continuous casting process, cutting this strip into lengths such that plates having the required superficial area are formed, immersing the cut lengths as unrefined electrodes in series in an electrolyte solution contained in a tank whose inner surface is of an electrically insulating synthetic polymeric material that is substantially inert to the electrolyte solution, maintaining the electrolyte solution at a temperature of at least 54°C (129°F), and passing direct current through the electrolyte solution to cause copper from one of the electrodes to be dissolved in the solution and deposited as pure copper on another of the electrodes, wherein baffles of an electrically insulating material that is substantially inert to the electrolyte solution are so positioned in the tank that flow of current between major facing surfaces of adjacent electrodes is not impeded and flow of current that would otherwise occur around at least some of the immersed edges of electrodes is substantially reduced.

3,928,152
METHOD FOR THE ELECTROLYTIC RECOVERY OF METAL EMPLOYING IMPROVED ELECTROLYTE CONVECTION

Walter W. Harvey, Bedford; Myron R. Randlett, Burlington, and Karlis L. Bangerskis, Walpole, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 445,435, Feb. 25, 1974. This application Oct. 17, 1974, Ser. No. 515,513
Int. Cl.² C25C 1/12
U.S. Cl. 204—106 **13 Claims**

(PRIOR ART)



1. A method of performing electrodeposition at a high ratio of current density to metal ion concentration in a cell which includes anodes, cathodes and an electrolyte with an attendant production of high quality metal which can be easily stripped from the cathodes comprising the following steps:

a. positioning non-conductive convection edge baffles adjacent to opposite edges of the anode faces so as to extend toward the cathode faces;

b. positioning non-conductive anode bottom extensions beneath the anodes;

c. providing cathodes that are wider than the anodes so that the edges of the cathodes extend outwardly from the convection edge baffles;

d. submerging the cathodes so that the submerged length of the cathodes are equal to or greater than the submerged length of the anodes and the anode bottom extensions;

e. positioning bubble tubes having orifices between the non-conductive anode extensions and the cathode faces;

f. spacing opposed anode and cathode faces apart from each other at a distance of about 1 ¼ inches or less; and,

g. electrodepositing metal on the cathodes while generating a sheet of gas bubbles from the bubble tubes through the electrolyte between opposed anode-cathode faces to produce agitation of the electrolyte over the cathode faces as metal is being deposited thereon and maintaining said convection edge baffles during electrodeposition to form enclosures between cathode and anode faces to minimize lateral spreading and contraction of the sheet of bubbles and prevent deposition of metal at the edges of the cathodes extending beyond the baffles, and maintaining said anode bottom extension during electrodeposition to prevent deposition of metal at the bottom of the cathode faces.

3,928,153
ELECTROWINNING PROCESS

Aubrey S. Gendron; Bommaraju V.K.S.R.A. Tilak, and Victor A. Ettel, all of Mississauga, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed Feb. 24, 1975, Ser. No. 552,247
Claims priority, application Canada, Apr. 9, 1974, 197211
Int. Cl.² C25C 1/08
U.S. Cl. 204—112 **10 Claims**

1. A process of electrowinning nickel from aqueous sulfate electrolytes comprising electrodepositing nickel at a cathode

current density of about 2 to about 10 amperes per square decimeter from a nickel-containing sulfate electrolyte maintained at a temperature in excess of 60°C and at a pH of about 1.5 to about 2.0 (as measured at cell temperature) and contained in a cell having no diaphragm isolating the cathode from an essentially insoluble anode and in which vigorous agitation of the electrolyte is maintained, while feeding nickel-containing electrolyte at a relatively high pH to said cell and withdrawing nickel containing electrolyte from said cell at rates to maintain a substantially constant volume of electrolyte in said cell, to maintain the required pH in said cell and to maintain a nickel bite of at least about 5 grams per liter.

3,928,154

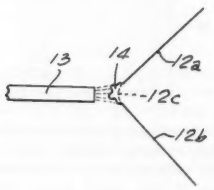
ELECTROCHEMICAL RADIUS GENERATION

James D. Andrews, Bloomfield Village, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 12, 1973, Ser. No. 350,388

Int. Cl.² C25F *3/00, 5/00*

U.S. Cl. 204—129.5 **8 Claims**



1. The method of generating a uniform radius on a workpiece having an extended edge which comprises positioning at least one generally tubular nozzle in spaced relationship to said edge of said workpiece, said nozzle being positioned to direct electrolyte substantially along a line of the series of lines that bisect the angles formed at said edge, passing a charged electrolyte through said nozzle and along said line to impinge upon said edge, and moving the nozzle along the contours of said edge while maintaining the position thereof and the passage of electrolyte therethrough substantially along one of said lines to thereby round off said edge.

3,928,155

METHOD AND MEANS FOR PROMOTING CO-AGULATION OF PARTICLES IN A LIQUID

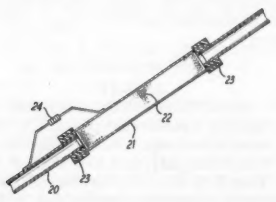
Derek A. Woodhouse, Burne House, Tittensor, Stoke-on-Trent, Staffordshire, England

Continuation-in-part of Ser. No. 854,976, Sept. 3, 1969, abandoned. This application Jan. 3, 1973, Ser. No. 320,787

Claims priority, application United Kingdom, Sept. 20, 1968, 44775/68; June 10, 1969, 29204/69

Int. Cl.² C23F *13/00*

U.S. Cl. 204—150 **6 Claims**



1. A method of treating a liquid to promote coagulation of particles in the water containing scale forming hardness factors, comprising the steps of:

a. providing two tubes made of two different electrically-conductive materials having different positions on the Galvanic Scale,

b. providing a connector member made of insulator material,

c. interconnecting the tubes in series by means of the connector so that liquid flowing through the tubes flows first through one of the tubes and then through the other,

d. electrically connecting the two tubes together by means which is not engaged by liquid flowing through the tubes, and

e. causing such water to flow through the tubes.

3,928,156

PROCESS FOR THE ELECTRODEPOSITION OF ZWITTERION-CONTAINING COMPOSITIONS

Marco Wismer, Gibsonia, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 840,848, July 10, 1969, abandoned. This application July 29, 1971, Ser. No. 167,476

Int. Cl.² C25D *13/06*

U.S. Cl. 204—181 **4 Claims**

1. A method of electrodepositing a resin upon a conductive substrate serving as an electrode in an electric circuit, which method comprises passing an electric current between said electrode and a counter-electrode in electrical contact with an aqueous electrodepositable composition comprising an aqueous dispersion of an ungelled, inherently water-dispersible epoxy group free electrodepositable resin containing Zwitterions, said Zwitterions consisting of a quaternary ammonium base group and a carboxyl group, thereby electrodepositing an adherent coating upon said electrode.

3,928,157

CATHODIC TREATMENT OF CHROMIUM-PLATED SURFACES

Yasuo Suematsu, Itami; Ryuhei Miyazaki, Ibaraki; Mitsuyasu Kubo, Neyagawa; Tsuyoshi Uotani, and Hironori Uchida, both of Hirakata, all of Japan, assignors to Shinto Paint Co., Ltd., Amagasaki and Uyemura & Co., Ltd., Osaka, both of, Japan

Filed May 7, 1973, Ser. No. 357,534

Claims priority, application Japan, May 15, 1972, 47-047899; May 15, 1972, 47-047900; May 15, 1972, 47-047901

Int. Cl.² C25D *13/06, 13/20*

U.S. Cl. 204—181 **13 Claims**

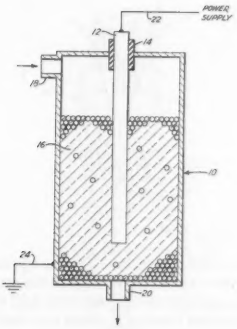
1. A method for treating a chromium-plated surface characterized by the fact that a chromium-plated article having an uppermost chromium-plated layer of a thickness of at least 0.2 micron and adjacent thereto, an intermediate nickel or nickel-alloy layer, is dipped as the cathode in a water-soluble or water-dispersible resin solution or dispersion prepared by diluting with water a resin salt of at least one synthetic polyamino resin and a water-soluble organic acid, a water-soluble inorganic acid or a mixture of said acids and then passing a direct current in the range of 10–300 volts through the aqueous bath so that there is formed a resin film on the chromium plated surface.

8. A method as claimed in claim 1 wherein the chromium-plated surface is pretreated before the electrodeposition so that the surface electrode potential as defined herein before has a value higher than −0.42 volt by means of an electrochemical or physical treatment.

3,928,158
ELECTROFILTER

G. Ray Fritsche, Bradford Woods, and Leonard W. Haniak, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 362,036, May 22, 1973, abandoned, which is a continuation of Ser. No. 193,966, Oct. 29, 1971, abandoned. This application Aug. 26, 1974, Ser. No. 500,476
Int. Cl.² B03C 5/00
U.S. Cl. 204—188 22 Claims



1. A method for removing finely divided suspended solid contaminants including electrically conductive solids from oils having a high resistivity and free of significant amounts of dispersed water which comprises flowing the oil substantially downwardly through interstitial spaces within a particulate bed of substantially spherical nonporous and nondeformable ceramic beads of high electrical resistivity having a smooth outer surface and diameters in the range of about 1/32 inch to about ¼ inch, and maintaining an electrostatic field having a voltage gradient of at least about 5 KV per inch substantially horizontally across said bed during the downward flow of the oil.

3,928,159
METHOD FOR FORMING PROTECTIVE FILM BY IONIC PLATING

Eiichi Tadokoro, and Tatsuji Kitamoto, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

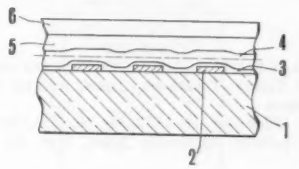
Filed Sept. 4, 1974, Ser. No. 503,125
Claims priority, application Japan, Sept. 4, 1973, 48-99642
Int. Cl.² C23C 15/00; C11B 5/00
U.S. Cl. 204—192 7 Claims

1. A method for formation of a protective layer on a magnetic recording substance by ionic plating comprising generating a glow discharge of nitrogen gas or an inert gas at a vacuum of about 1×10^{-1} to about 1×10^{-5} mmHg between a magnetic recording substance as a substrate and at least one metal selected from the group consisting of Group IB, Group IIB, Group VIB, Group VIIB and Group VIIIB metals as an evaporative source and applying a voltage so that the electric potential of said substrate is more negative than the electric potential of said evaporative source.

3,928,160
COLOUR PICKUP TUBES AND METHOD OF MANUFACTURING THE SAME

Saburo Nobutoki, Mobara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 5, 1974, Ser. No. 503,329
Claims priority, application Japan, Oct. 5, 1973, 48-111445
Int. Cl.² C23C 15/00; H01J 31/00
U.S. Cl. 204—192 7 Claims

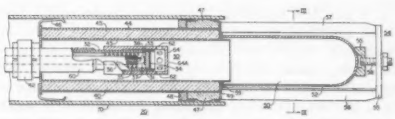


1. In a method of manufacturing a colour pickup tube of the class wherein an optical colour analyzing filter is formed on a substrate, a layer of transparent inorganic substance is formed on said optical colour analyzing filter, and then a photoelectric converting element is formed by successively applying a transparent electroconductive film and a photoconductive film upon said layer of transparent inorganic substance, the improvement which comprises the steps of sputtering a first layer of said transparent inorganic substance upon said filter in a first mixed atmosphere of an inert gas and oxygen, and then sputtering a second layer of said transparent inorganic substance upon said first layer in a mixed atmosphere containing inert gas and a smaller quantity of oxygen than said first mixed atmosphere.

3,928,161
GAS MEASURING PROBE FOR INDUSTRIAL APPLICATIONS

William H. McIntyre, Orrville, Ohio; Richard W. Wallace, and Matthew J. Troha, both of Allison Park, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 247,368, April 25, 1972. This application Mar. 22, 1974, Ser. No. 454,031
Int. Cl.² G01N 27/46
U.S. Cl. 204—195 S 3 Claims



1. In a solid electrolyte electrochemical cell assembly adapted for monitoring gas constituents at elevated temperatures wherein the solid electrolyte electrochemical cell is a solid electrolyte member having a first electrode disposed in contact with a first surface of the solid electrolyte member and a second electrode disposed in contact with the opposite surface of the solid electrolyte member, said solid electrolyte electrochemical cell forming the closed end of a tubular member, the improvement for heating said solid electrolyte electrochemical cell, wherein said improvement comprises:

heating means inserted within said tubular member and disposed adjacent to the surface of the solid electrolyte member contacted by the first electrode and remote from the solid electrolyte surface contacted by said second electrode for directly heating said tubular member and the electrolyte surface contacted by said first electrode, and

heat conductive means in thermal contact with the external surface of said tubular member and having an end portion

extending adjacent and parallel to and spaced apart from the electrolyte surface contacted by said second electrode to define therebetween a gas cavity and to heat said electrolyte surface contacted by said second electrode, said heat conductive means including apertures therethrough to permit the flow of gas containing constituents to be monitored to enter said cavity and contact said electrolyte surface contacted by said second electrode.

3,928,162
GAS FLOW COULOMETRIC DETECTOR

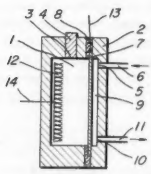
Yoshinori Takata, Tokaimura, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 16, 1972, Ser. No. 235,120

Claims priority, application Japan, Mar. 19, 1971, 46-15146

Int. Cl.² G01N 27/46

U.S. Cl. 204—195 R **21 Claims**



1. A gas flow coulometric detector driven with a predetermined constant voltage comprising a casing filled with an electrolyte, means for defining a sample gas passage within said casing, means for flowing a sample gas through said passage, said means for defining said sample gas passage including a porous operating electrode having a first surface in contact with said sample gas flowing through said passage, a second surface in contact with said electrolyte, and many pores providing communication means between said two surfaces, said porous operating electrode having the property that it inhibits undesirable permeation of said electrolyte from said second surface to said first surface through said pores, a counter electrode spaced from and disposed opposite to said operating electrode in said casing on the side of said second surface of said operating electrode so as to be in contact with said electrolyte, said counter electrode having a surface parallel to the second surface of said operating electrode, said counter electrode being made of a material selected from the group consisting of Ag-AgCl, Hg-Hg_2Cl_2, Ag-AgBr and Ag-AgI and being in the form of a meshed structure, means for applying said predetermined voltage, the value of which is suitable for the selective quantitative analysis of said sample gas, across said operating electrode and said counter electrode so that electrolysis can be carried out due to the contact between said electrolyte and said sample gas in said pores, and means for detecting the quantity of electricity appearing during said electrolysis.

3,928,163
SPARK DISCHARGE AND ELECTRO-CHEMICAL EROSION MACHINING APPARATUS

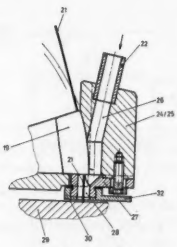
Werner Ullmann, Locarno; Bernd Schumacher, Losone; Silvano Mattei, Locarno-Solduno; Hans-Ueli Fenner, Ascona, and Arno Sieg, Locarno, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Apr. 23, 1974, Ser. No. 463,317

Claims priority, application Switzerland, Sept. 11, 1973, 13062/73

Int. Cl.² B23P 1/04, 1/08

U.S. Cl. 204—206 **16 Claims**



1. An electro-erosion machine tool comprising a filamentary erosion electrode (**21**) and electrode guide and fluid delivery means, said electrode guide and fluid delivery means comprising a portion forming a guide for receiving said filamentary erosion electrode (**21**) and guiding movement of the electrode in the direction of the electrode axis, a portion defining an outlet for discharging a fluid medium alongside of said electrode in contact with the outer surface thereof and parallel to the axis thereof towards a working area of said electrode, and a portion providing duct means for leading said fluid medium from a supply conduit to said outlet in such a way as to cause said fluid medium to be discharged through said outlet as aforesaid when supplied from said supply conduit.

10. A spark-discharge erosion machine tool comprising supporting and guiding means (**1**) for supporting and guiding movement of a filamentary erosion electrode (**2**), fluid delivery means (**4**) which is positioned near the supporting and guiding means and which comprises portions defining an outlet for passing a dielectric flushing medium to a working area of said electrode to assist erosion thereby, collecting means (**5** and **6**) positioned and constructed for collecting used flushing medium passing from said working area, and a regeneration system which is constructed and arranged for receiving said used flushing medium from said collecting means, for regenerating it and for returning it to said fluid outlet means, the regeneration system including conductivity determining means (**12**) operably connected for determining the conductivity of said used flushing medium, and deionising means (**14**) which is connected for being brought into operation to deionise said used flushing medium under the control of said conductivity determining means when the conductivity of the used flushing medium rises above a predetermined level.

3,928,164
ALTERNATING CURRENT ELECTROLYTIC CELL

John C. Shepard, Jr., Lake Jackson; Robert C. Wight, Sugar Land, and Phillip W. Kosted, Rusk, all of Tex., assignors to Nalco Chemical Company, Chicago, Ill.

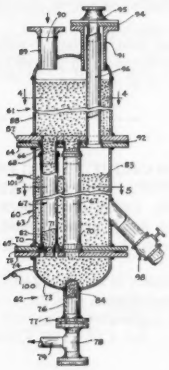
Filed Dec. 12, 1973, Ser. No. 423,913

Int. Cl.² C25B 9/00

U.S. Cl. 204—260 **11 Claims**

1. An electrolytic cell for producing organometallic compounds comprising, a substantially tubular upstanding metal

vessel including a central main shell, a top closure member mounted at the upper end of the main shell, and a bottom closure member mounted at the lower end of the main shell, means electrically insulating said top and bottom closure members from the main shell, at least one tubular perforate electrode insulating spacer extending through the main shell, means supporting said spacer at the opposite ends thereof and electrically insulating same from said main shell and from the closure members, a particulate consumable electrically conductive material in said tubular spacer defining one electrode and being supported by and in contact with the bottom closure member, a particulate consumable electrically conductive



material surrounding said tubular spacer and in contact with the main shell defining a second electrode, first opening means in said upper closure member for permitting the addition of particulate material to said first electrode, second opening means in said upper closure member for permitting the addition of particulate material to said second electrode, means supporting and electrically insulating the lower end of the second electrode from the bottom closure member, means connecting said first and second electrodes to a source of alternating current potential, and openings in said top and bottom closure members for permitting a Grignard reagent solution to flow through the vessel to be electrolyzed and thereby produce an organometallic compound.

3,928,165
ELECTROLYTIC CELL INCLUDING MEANS FOR SEPARATING CHLORINE FROM THE CHLORINE-ELECTROLYTE FROTH FORMED IN THE CELL

Loyd W. Piester, New Martinsville, W. Va., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 376,087, July 2, 1973, Pat. No. 3,855,091, which is a continuation-in-part of Ser. No. 219,096, Jan. 19, 1972, abandoned. This application July 5, 1974, Ser. No. 486,121

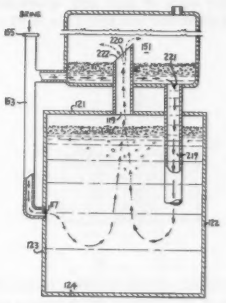
Int. Cl.² C25B *9/00*

U.S. Cl. 204—278 **6 Claims**

5. In an electrolytic cell for the electrolysis of brines at currents above 2,500 amperes per square foot of horizontal area whereby a froth of chlorine and electrolyte is generated, the improvement comprising:

means having a cross-sectional area of less than 0.050 square feet per cubic foot of cell volume for removing froth from the cell to a disengaging tank having a cross-sectional area in excess of 0.06 square feet per cubic foot of cell volume;

means for changing the momentum vector and flow direction of the froth prior to discharging the froth into the disengaging tank;



means for thereafter discharging the froth into the disengaging tank above the level of liquid therein; and

means for returning liquid from the disengaging tank to the electrolytic cell.

3,928,166
DIMENSIONALLY ADJUSTABLE ANODE-DIMENSIONALLY STABLE DIAPHRAGM COMBINATION FOR ELECTROLYTIC CELLS

Kevin J. O'Leary, Cleveland Heights; Charles P. Tomba, and Robert W. Fenn, III, both of Painesville, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Mar. 1, 1974, Ser. No. 447,215

Int. Cl.² C25B *11/02, 13/02*

U.S. Cl. 204—282 **3 Claims**

1. An improvement in a cell for the electrolysis of aqueous alkali metal chloride solutions comprising a container divided into anode-containing and cathode-containing compartments by a hydraulically permeable diaphragm, which improvement comprises, in combination:

a. as said anode, a dimensionally adjustable electrode comprising an anode-working face, an anode riser, and a moveable means for connecting the anode working face and anode riser with electrical integrity, and b. as said diaphragm, a dimensionally stable, heat-fused, polyfluorocarbon-asbestos diaphragm, said diaphragm having a discontinuous polyfluorocarbon coating binding the asbestos together.

3,928,167
IMPROVEMENTS IN METHODS OF PRODUCING ELECTROLYTIC ANODE ASSEMBLIES

Pierre Buoy, Enghien-les-Bains; Daniel Masure, La Madeleine; Paul Collon, Autreville; Jean-Marie Pigeaud, Martigues, and Bernard Sartre, Levallois-Perret, all of France, assignors to Rhone-Progil, Paris, France

Division of Ser. No. 316,515, Dec. 19, 1972. This application May 15, 1974, Ser. No. 470,167

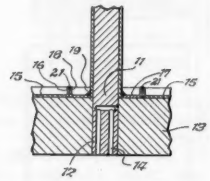
Claims priority, application France, Dec. 23, 1971, 71.46296

Int. Cl.² C25C *7/02*

U.S. Cl. 204—286 **2 Claims**

1. A method of providing a replaceable anode assembly in an electrolytic diaphragm cell, said cell comprising a plurality of vertical substantially flat and hollow anodes formed, as regards at least one of their two substantially parallel faces, by a sheet of a film-forming metal, said anodes being secured to the base of the cell by means of extended portions which pass through the base, said extended portions comprising a core made of a metal which is a good electrical conductor, which core is covered by a sheath made of a film-forming metal, a

good electrical contact being ensured between the sheath and the core, said base of the cell being of an electroconductive metal, which base is protected by a sheet of film-forming metal, said core of said extended portions is exposed where it passes through the base of said cell, characterized in that sealing between said anode and said base is effected by weld-



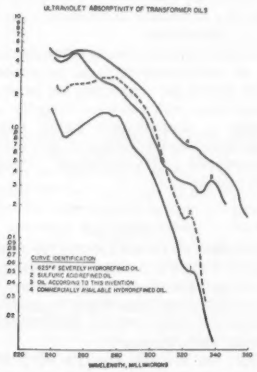
ing cup-shaped washers of film-forming metal affixed to said extended portions of said anodes and having a raised edge, to the film-forming metal sheet which protects the base of the cell, whereby said film-forming metal sheet which has a raised edge corresponding to the raised edge of said cup-shaped washers is welded at the raised edges of said cup-shaped washers to effect a seal.

3,928,168

OIL AND PROCESS OF MANUFACTURE OF BLENDED HYDROREFINED OIL

Ivor W. Mills, Media, and Glenn R. Dimeler, West Chester, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 873,008, Oct. 31, 1969, abandoned. This application Dec. 10, 1973, Ser. No. 423,362
Int. Cl. C10g *31/00*
U.S. Cl. 208—14 **10 Claims**


ULTRAVIOLET ABSORPTIVITY OF TRANSFORMER OILS
CURVE IDENTIFICATION
1. 625°F SEVERELY HYDROREFINED OIL
2. SULFURIC ACID REFINED OIL
3. OIL ACCORDING TO THIS INVENTION
4. COMMERCIALLY AVAILABLE HYDROREFINED OIL.
WAVELENGTH, MILLIMICRONS

1. Process for preparing a hydrocarbon fluid of improved oxidation stability from a severely hydrorefined oil having a viscosity from 30 to 500 SUS at 100°F and an ultraviolet absorptivity of less than 0.04 in the 335 millimicron region, said process comprising adding to the severely hydrorefined oil an unrefined distillate of a recycle stock obtained from catalytic cracking of gas oil which is rich in polynuclear hydrocarbons having at least four condensed aromatic rings and recovering a blended oil having an absorptivity at 335 millimicrons at least 15% greater than that of said hydrorefined oil and less than 2.5.

3,928,169

PRODUCTION OF PITCH SUBSTANTIALLY SOLUBLE IN QUINOLINE

Edward Patrick Conroy, Montreal, Canada, assignor to Domtar Limited, Montreal, Canada

Filed May 6, 1974, Ser. No. 466,890
Int. Cl.² C10C *1/16*
U.S. Cl. 208—22 **6 Claims**

1. A process for producing pitch from a coal tar material comprising: distilling said coal tar material under atmospheric or reduced pressure to produce a pitch and distillate oil,

separating from said distillate oil a heavy creosote oil fraction having at least 90% of its constituents boiling above 300°C,

subjecting said creosote oil fraction to heat treatment at temperatures 400° – 470°C under pressure 15 – 500 psig to produce a pitch, and

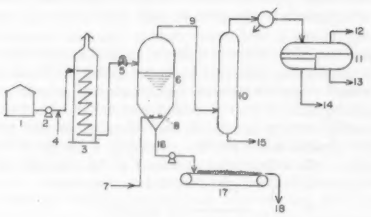
terminating said heat treatment when a pitch having a DMFI content between 10 and 30% and a QI content not greater than 2% is obtained.

3,928,170

METHOD FOR MANUFACTURING PETROLEUM PITCH HAVING HIGH AROMATICITY

Ryoichi Takahashi; Takuji Hosoi, both of Tokyo; Takaaki Aiba, Yokohama, and Tsutomu Konno, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 240,619, April 3, 1972, abandoned. This application Aug. 22, 1974, Ser. No. 499,858
Claims priority, application Japan, Apr. 1, 1971, 46-19230
Int. Cl.² C10G *9/36*
U.S. Cl. 208—40 **4 Claims**



1. A process for the liquid phase cracking and aromatization of a reduced crude oil residuum consisting mainly of aliphatic hydrocarbons to produce pitch having a H/C ratio of 0.4 – 1.1 and a non-pitch oil containing a major portion of aliphatic hydrocarbons, said process comprising:

providing, in a reaction zone, a vapor phase and a continuous liquid phase, which includes said residuum, at a total pressure less than 3.0 kg/cm³G with a liquid dwell time of 0.5 to 20 hours;

feeding a non-oxidative heat transfer medium at a temperature within the range of 400°C to 2000°C through and in direct contact with said liquid phase in said reaction zone to maintain said liquid phase at a temperature of 350°–450°C, to induce a polycondensation reaction in said liquid phase, and to strip volatile components from said liquid phase;

controlling the feed rate of said heat transfer medium to maintain the partial pressure in mmHg of organics in said vapor phase at less than about:

$$1.03 \times 10^{11} \times e^{-\frac{12200}{T+228}}$$

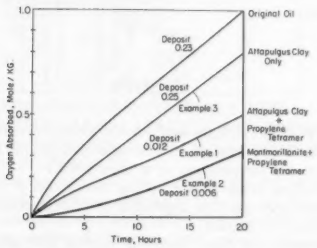
wherein T is the temperature (°C) of the liquid phase within the reaction zone; and

removing a non-pitch overhead from said reaction zone and recovering said pitch as the bottoms product of said reaction zone.

3,928,171
METHOD OF STABILIZING OILS AND PRODUCTS THEREOF

Tsoung-Yuan Yan, Trenton, and Robert F. Bridger, Hopewell, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 268,293, July 3, 1972, abandoned. This application Feb. 28, 1974, Ser. No. 440,617
Int. Cl.² C10G *41/00*
U.S. Cl. 208—46 **12 Claims**



1. A method of improving the light stability of a hydrocracked hydrocarbon mineral oil and lessening the formation of sludge material in said oil which comprises reacting said oil with an olefin, in the presence of a catalyst consisting of an acidic resin wherein the resin is a polymeric resin selected from the group consisting of phenolic resin, styrene resin and styrene copolymer resin having as the acidic radicals attached thereto a radical selected from the group consisting of sulfonic-containing radicals and phosphonic-containing radicals.

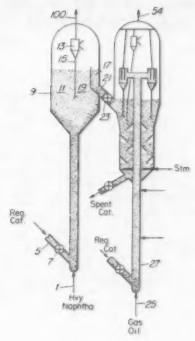
3,928,172
CATALYTIC CRACKING OF FCC GASOLINE AND VIRGIN NAPHTHA

Francis E. Davis, Jr., Woodbury; Richard G. Graven; Wooyoung Lee, both of Westmont, and Robert A. Sailor, Riverton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 2, 1973, Ser. No. 376,091
Int. Cl.² B01J *29/28*; C10G *11/04*, *37/02*
U.S. Cl. 208—77 **10 Claims**

1. A method for upgrading hydrocarbons which comprises cracking a gas oil boiling range feed in a first cracking zone in the presence of a crystalline zeolite cracking catalyst at an elevated temperature of at least 850°F to obtain conversion of the gas oil feed to materials including a heavy cycle oil, a light cycle oil, a heavy naphtha fraction and materials lower boiling than said heavy naphtha fraction,

cracking the heavy naphtha fraction above obtained in a second cracking zone in the presence of freshly regenerated crystalline zeolite cracking catalyst at an elevated temperature within the range of 850°F to about 1000°F, separating the product of said heavy naphtha fraction cracking operation in a zone separate from the gas oil product separation under conditions to recover gasoline boiling range material rich in aromatics and lighter hydrocarbon material from a light cycle oil product material, combining said light cycle oil recovered products, combining materials lower boiling than said heavy naphtha product of gas oil cracking with said gasoline boiling and lighter materials separated from the product of said heavy naphtha cracking operation and

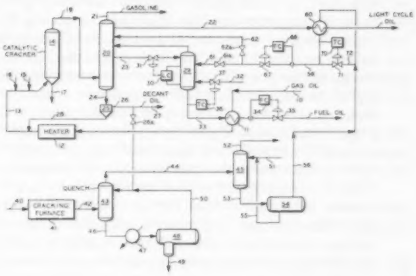


separating the combined materials lower boiling than light cycle oil into a gasoline boiling range product fraction and a lower boiling uncondensed vaporous product fraction.

3,928,173
INCREASED PRODUCTION OF DIESEL OIL AND FUEL OIL

John P. James, Old Ocean, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 21, 1974, Ser. No. 471,879
Int. Cl.² C10G *39/00*
U.S. Cl. 208—78 **6 Claims**

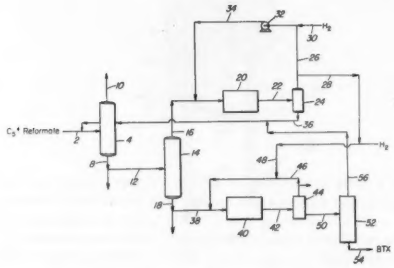


1. A process which comprises cracking a hydrocarbon oil in a cracking zone; passing the effluent from the cracking zone to a fractionation zone to separate the effluent into a plurality of streams including a gasoline stream, a light cycle oil stream, a heavy cycle oil stream and a kettle product stream; removing a residual oil from the kettle product stream; thermally cracking a hydrocarbon feed to produce an effluent stream containing unsaturated gaseous hydrocarbons; contacting said effluent stream in a quench zone with a stream of said residual oil to quench said effluent stream; removing a first stream containing a light oil and cracked gases and a second stream containing a rich oil from said quench zone; separating a stream of light oil from said first stream; and returning said light oil stream to said fractionation zone.

3,928,174
COMBINATION PROCESS FOR PRODUCING LPG AND AROMATIC RICH MATERIAL FROM NAPHTHA

John C. Bonacci, Cherry Hill; Henry P. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 2, 1975, Ser. No. 538,221
Int. Cl.² C10G 37/06; B01J 29/28
U.S. Cl. 208—80 **20 Claims**



1. A method for redistributing the paraffin-aromatic components of a reformate product of catalytic reforming comprising C_5 and higher boiling hydrocarbons which comprises, separating C_5 and lower boiling components of catalytic reforming from C_6 and higher boiling materials in a first separation zone,

separating the C_6 and higher boiling material in a second separation zone into a first fraction comprising some C_7 components and lower boiling paraffin and aromatic components and a second fraction comprising C_7 and higher boiling paraffins and aromatic components,

passing said first fraction in contact with a first crystalline zeolite catalyst having properties for cracking paraffins to form LPG materials and redistribute the ratio between benzene and toluene components in the feed, separating product material of said first crystalline zeolite conversion operation into gaseous material comprising C_2 and lower boiling material from material comprising C_3 and higher boiling components, passing the C_3 and higher boiling material to said first separation zone,

passing a portion of said second fraction comprising C_7 and higher boiling paraffins and aromatics in contact with a separate second mass of crystalline zeolite catalyst having properties for cracking said paraffins and disproportionating aromatic to form a mixture of benzene, toluene and xylene; separating the product of said second zeolite catalyst conversion operation to recover a hydrogen rich stream, a stream rich in benzene, toluene and xylene aromatics and an intermediate product stream lower boiling than said aromatic rich stream, and recycling said intermediate product stream to said first separation zone.

3,928,175
UPGRADING CRUDE OIL BY COMBINATION PROCESSING

Hartley Owen, Belle Mead, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

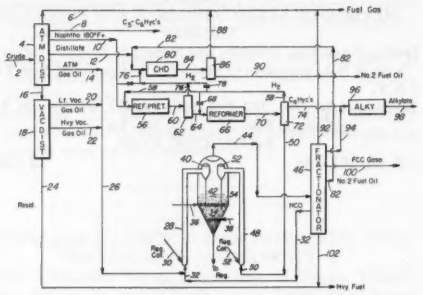
Continuation of Ser. No. 363,705, May 24, 1973, abandoned.
This application Aug. 14, 1974, Ser. No. 497,428
Int. Cl.² C10G 37/10
U.S. Cl. 208—93 **8 Claims**

1. In a combination process for upgrading crude oils by catalytic cracking, reforming, desulfurization and alkylation, the improvement which comprises,

separating a curde oil to recover gas oils, light and heavy naphtha boiling hydrocarbons and a distillate fraction boiling in the range of about 400°F. to about 650°F.

pretreating the heavy naphtha fraction to remove sulfur and nitrogen, reforming the pretreated heavy naphtha under conditions primarily restricted to dehydrogenation of naphthenes thereby forming a hydrogen rich gas stream, a C_4 hydrocarbon rich stream and a low octane liquid reformate stream,

catalytically cracking said low octane liquid reformate in a first riser conversion zone in the presence of a crystalline zeolite conversion catalyst at an elevated temperature of at least 1000°F. and a hydrocarbon residence time within the range of 1 to 8 seconds,



catalytically cracking said gas oils with a crystalline zeolite conversion catalyst in a second conversion zone at an elevated temperature of at least 1000°F.,

recovering from said cracking operations a low boiling olefin rich fraction, a gasoline product fraction and a No. 2 fuel oil fraction,

combining the No. 2 fuel oil fraction with said distillate fraction and subjecting the combined fractions to catalytic hydrodesulfurization in the presence of hydrogen rich gas recovered from said reforming operation,

alkylating said low boiling olefins with said C_4 hydrocarbons and collecting the gasoline boiling products of said combination operation for gasoline blending.

3,928,176
HEAVY CRUDE CONVERSION

Glen P. Hamner; Mamerto G. Luzarraga, and Alto Nelson Stuckey, Jr., all of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 1, 1974, Ser. No. 456,989
Int. Cl.² C10G 37/00
U.S. Cl. 208—97 **20 Claims**

1. In a process for upgrading the 1050°F.+ materials of a metals containing heavy crude or residua by conversion of the 1050°F.+ materials to produce 1050°F.− materials, the improved combination comprising

contacting said heavy crude or residua in an initial reaction zone, in the presence of added hydrogen, with a catalyst characterized as comprising a composite of from about 5 to about 30 percent of a Group VIB metal, or compound thereof, from about 1 to about 12 percent of a Group VIII metal, or compound thereof, or admixture of said Group VIB and Group VIII metals, or compounds thereof, and a porous inorganic oxide support, said catalyst including a combination of properties comprising at least about 50 percent of its total pore volume of absolute pore diameters ranging from about 200A to about 300A, and less than about 20 percent of its total pore volume are of absolute pore diameters ranging from 0 to about 100A, a surface area ranging at least about 200 m^2/g to about 600 m^2/g and a pore volume ranging from about 0.8 cc/g to about 3.0 cc/g, at severity sufficient to convert at least about 30 percent of the 1050°F.+ material to 1050°F.− material, while removing at least about 75 percent of the heavy metals from the feed, and

contacting product of said initial reaction zone in a subsequent reaction zone, in the presence of added hydrogen, with a catalyst which contains a metal hydrogenation component, and above about 30 percent aluminum phosphate, based on the weight of the catalyst (dry basis) exclusive of the hydrogenation component, said catalyst having at least about 90 percent of its total pore volume of absolute diameter within the range of about 15A to about 100A, a surface area ranging from about 200 m^2/g to about 600 m^2/g and a pore volume ranging from about 0.25 to about 0.75 cc/g, and the reaction is conducted at severities sufficient to hydrodenitrogenate the 1050°F.− fraction of the product of said initial reaction zone fed thereto to the extent of at least about 30 percent, based on the weight of total nitrogen contained in the reaction mixture, the nitrogen being eliminated as ammonia.

3,928,177
HYDROCARBON CONVERSION WITH A MULTIMETALLIC CATALYTIC COMPOSITE

John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 216,739, Jan. 10, 1972, Pat. No. 3,806,446, which is a division of Ser. No. 17,886, March 9, 1970, abandoned. This application Feb. 14, 1974, Ser. No. 442,714The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.² C10G *35/08, 13/10;* **C07C** *3/34*

U.S. Cl. 208—139 **23 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.01 to about 5 wt. % Group IVA metal selected from tin and germanium, about 0.01 to about 3 wt. % Group VIB transition metal and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, Group IVA metal and Group VIB transition metal are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the Group IVA metal and the Group VIB transition metal are present in oxidation states above that of the corresponding elemental metals, wherein the halogen component is present in the form of combined halide, and wherein the atomic ratio of Group VIB transition metal to platinum group metal is about 0.05:1 to about 4:1.

23. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal selected from palladium and iridium, about 0.01 to about 5 wt. % Group IVA metal, about 0.01 to about 3 wt. % Group VIB transition metal and about 0.1 to about 3.5 wt. % halogen, wherein the platinum group metal, Group IVA metal and Group VIB transition metal are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state, wherein substantially all of the Group IVA metal and the Group VIB transition metal are present in oxidation states above that of the corresponding elemental metals, wherein the halogen component is present in the form of combined halide, and wherein the atomic ratio of Group VIB transition metal to platinum group metal is about 0.05:1 to about 4:1.

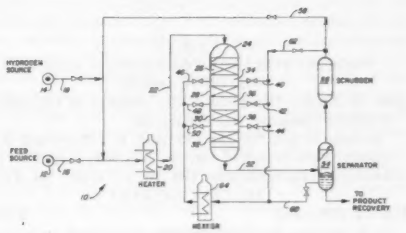
3,928,178
METHOD OF CONTROLLING CATALYST DEPOSITS IN HYDRODESULFURIZATION

Clifton G. Frye, Valparaiso, and Warren L. McBride, Griffith, both of Ind., assignors to Standard Oil Company, Chicago, Ill.

Filed June 12, 1974, Ser. No. 478,629

Int. Cl.² C10G *23/00*

U.S. Cl. 208—210 **6 Claims**



1. In a hydrodesulfurization process combining the steps of preheating in the range of about 625° to about 800°F a process stream comprising liquid hydrocarbons boiling above 650°F and hydrogen gas, passing said process stream into a reactor containing a plurality of fixed catalyst beds spaced axially therein, said reactor having connected thereto a plurality of quench fluid inlet means between each two adjacent catalyst beds, reacting said process stream in the presence of desulfurization catalyst contained in a first catalyst bed and successive downstream catalyst beds including a last catalyst bed, extracting heat from said process stream by injecting through said quench fluid inlet means, a cool quench fluid into admix communication with said process stream subsequent to its exit from each catalyst bed but prior to its entry into the next successive downstream catalyst bed, wherein the process stream is progressively desulfurized as it passes through each successive catalyst bed, said desulfurization being accompanied by the deposition of metallic and carbonaceous materials on said catalyst, the accumulation of said deposits being greatest in said first catalyst bed and least in said last catalyst bed whereby progressive catalyst bed plugging and pressure-drop buildup occur, causing premature termination of the process run, the improvement comprising:

a. providing means for detecting incipient bed plugging and subsequent pressure-drop buildup in said first catalyst bed and each successive downstream catalyst bed preceding and upstream of said last catalyst bed;
b. providing a plurality of heating fluid inlet means, connecting with said reactor between each two adjacent catalyst beds;
c. sensing incipient plugging by said detecting means in said first catalyst bed caused by said accumulated deposits on the catalyst therein;
d. reducing the temperature of the process stream entering said first catalyst bed by an amount sufficient to reduce or eliminate the desulfurization activity thereby reducing or eliminating the further accumulation of metallic and carbonaceous deposits on the catalyst bed therein;
e. increasing the temperature of the hydrodesulfurization reaction stream subsequent to its exit from said first catalyst bed but prior to its entry into the next successive downstream catalyst bed, by an amount greater than the temperature reduction effected in step (d), by injecting through said heating fluid inlet means, a heated recycle oil to admix with said hydrodesulfurization reaction stream, thereby increasing the desulfurization rate in said next successive downstream catalyst bed, and each additional downstream catalyst bed thereafter to the last to

compensate for the reduced desulfurization rate in said first catalyst bed; and

f. repeating steps (c), (d) and (e) for each successive catalyst bed downstream of said first catalyst bed and upstream of said last catalyst bed, whereby the level of catalyst deposits in each catalyst bed upstream of the last catalyst bed are controlled permitting an extended process run.

3,928,179

PROCESS FOR HYDROREFINING A RESIDUAL HYDROCARBON

John G. Gatsis, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 386,137, Aug. 6, 1973, which is a continuation-in-part of Ser. No. 263,367, June 5, 1972, abandoned. This application Oct. 16, 1974, Ser. No. 515,374

Int. Cl.² C10G *23/02*

U.S. Cl. 208—213 **3 Claims**

1. A process for hydrorefining a residual hydrocarbon charge stock which comprises reacting said charge stock with hydrogen in contact with a catalyst prepared by combining an aqueous solution of a soluble Group V-B metal compound and phosphoric acid, contacting a slurry of a refractory inorganic oxide hydrogel with the resulting aqueous solution, drying the resulting impregnated hydrogel and calcining the dried composite in an oxidizing atmosphere at a temperature of from about 315° to about 650°C., the Group V-B metal compound and phosphoric acid being utilized in an amount sufficient to provide a final catalyst composite containing from about 2 to about 30 weight percent Group V-B metal oxide, and from about 1 to about 25 weight percent phosphorous oxide, said Group V-B metal oxide and phosphorous oxide being in a weight ratio of from about 1 to about 2.

ALH

3,928,180

HYDRODESULFURIZATION WITH A CATALYST CONTAINING ALUMINA DERIVED FROM ALUMINUM SULFATE AND ALUMINUM CHLORIDE HYDROSOL

Lee Hilfman, Mt. Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 341,441, March 15, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 533,091

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **9 Claims**

1. A process for desulfurizing a sulfur-containing petroleum hydrocarbon fraction which comprises passing said petroleum fraction and hydrogen in contact with a catalytic composite at hydrodesulfurization reaction conditions, said catalytic composite comprising from about 5 to about 20 wt. % Group VIB metal or metal oxide and from about 0.1 to about 10 wt. % Group VIII metal or metal oxide on an alumina carrier material, said carrier material having been prepared by:

a. commingling aluminum sulfate and ammonium hydroxide in aqueous solution at a pH of from about 5.5 to about 6.5 to precipitate a basic aluminum sulfate;

b. dissolving said basic aluminum sulfate in an aluminum chloride hydrosol, said hydrosol having an aluminum/chloride weight ratio of from about 0.9:1 to about 1.4:1;

c. commingling urea and hexamethylenetetramine with the resulting hydrosol of step (b) and dispersing said misture as droplets in a hot oil bath to form hydrogel spheres;

d. aging the resulting hydrogel spheres at a temperature effecting decomposition of the residual urea and hexamethylenetetramine, and washing, drying and calcining the aged spheres to form said carrier material.

3,928,181

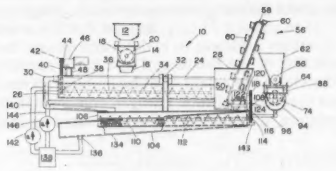
SEED SEPARATOR

John E. Iseman, Hartsville, S.C., assignor to Coker's Pedigreed Seed Company, Hartsville, S.C.

Filed Dec. 3, 1973, Ser. No. 412,304

Int. Cl. B03b *5/30*

U.S. Cl. 209—11 **2 Claims**



1. Cotton seed separator apparatus comprising a delivery trough having a helix screw for moving raw material having cotton seed and undesirable material therein; a separator trough having a helix screw therein for moving the separated seed; conduit means for removing the undesirable material from said separator trough; a receptacle for receiving the separated cotton seed; conveyor means having perforated cups for moving the cotton seed; hopper means for receiving the cotton seed from the perforated cups; trough means having a screw therein for conveying the separated cotton seed to a dryer; said second trough being perforated to permit the draining of liquid therefrom; a third trough associated with said second trough for receiving any liquid that may be drained therefrom; said third trough connected by a conduit to a fifth trough; a fourth trough having a screw mounted therein for conveying undesirable material separated from the cotton seed; said fourth trough being perforated to permit liquid to drain into said fifth trough; said fifth trough mounted below said fourth trough to receive liquids and permit the circulation thereof; liquid storage means connected with said first trough and said fifth trough to permit liquid to be recirculated from said first, second, third, fourth and fifth troughs.

3,928,182

METHOD AND APPARATUS FOR CLASSIFYING VISCOUS SLURRIES

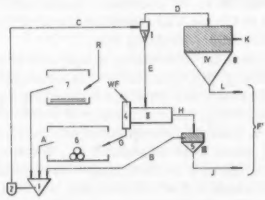
Theodor Eder, Vienna, Austria, assignor to Waagner-Biro Aktiengesellschaft and Chemie und Metall GmbH Rheax, both of Vienna, Austria

Filed Sept. 30, 1974, Ser. No. 510,556

Claims priority, application Austria, Oct. 2, 1973, 8397/73

Int. Cl.² B03B *7/00*

U.S. Cl. 209—12 **18 Claims**



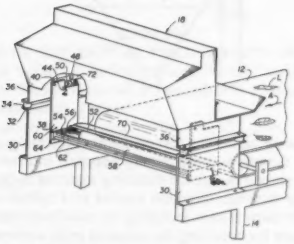
1. In a method of operating a system for sharply classifying wet slurries for sharply separating fine particles from coarse particles in at least three stages, comprising the steps of delivery a slurry with particles which are to be classified suspended therein to a first stage, centrifugally separating fine particles from coarse particles in the slurry at the first stage, delivering the coarse particles separated at the first stage to a second stage, gravitationally separating coarse from fine particles at said second stage, delivering the fine particles in the slurry

which are separated at the second stage to a third stage, separating fine from coarse particles at the third stage and returning the fine particles separated at the third stage back to the first stage, while providing for an output made up of the coarse particles derived in the slurry from the third stage and at least part of the fine particles centrifugally separated from the coarse particles at the first stage.

3,928,183
TOBACCO SORTING APPARATUS

Emil S. Asfour, 21 Wengirain, 8704 Herrliberg, Switzerland

Continuation of Ser. No. 453,079, March 20, 1974. This application Dec. 16, 1974, Ser. No. 533,029
Int. Cl.² B07C *5/342*
U.S. Cl. 209—73 **19 Claims**

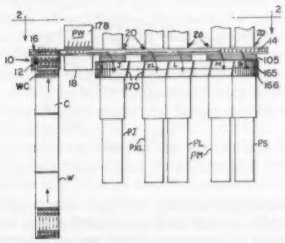


1. In combination with tobacco sorting apparatus comprising a conveyor for tobacco leaves having a forward end, a sensing system mounted above the forward end of said conveyor, and an end plate spaced below said sensing system in operative position adjacent said forward end of said conveyor, apparatus for mounting said end plate comprising a pair of elongated arm members spaced apart at least an amount equal to the width of the conveyor, means at the lower end of each of said arm members for supporting the end plate in operative position with respect to the forward end of said conveyor, means at the upper end of said arms for pivotally mounting said arm members to permit said plate to swing away from said forward end of said conveyor, and means for resiliently biasing said arm members toward said forward end of said conveyor to maintain said end plate in operative position adjacent thereto.

3,928,184
EGG HANDLING APPARATUS

Wayne H. Anschutz, 309 East 47th, Topeka, Kans.

Filed Sept. 19, 1973, Ser. No. 398,636
Int. Cl. B07c *5/28*
U.S. Cl. 209—74 R **31 Claims**



1. An apparatus for separating shell eggs into a predetermined number of groups, according to the weight of the individual eggs, in preparation for packing or further handling of the separated groups, which apparatus comprises an elongate support frame, a traveling conveyor having longitudinally spaced, individual egg accommodating pockets mounted on said support frame with the top run thereof traveling between a weighing area at the receiving end thereof and a series of transfer areas in the form of stations spaced along the length of said support frame, a plurality of individual egg weighing mechanisms arranged at said receiving end which are spaced along the conveyor according to the spacing of the egg accommodating pockets on said conveyor, means for intermittently driving the conveyor so as to position successive groups of pockets for receiving eggs from said weighing means, means for delivering successive eggs to the individual weighing mechanisms, means for transferring the eggs from the weighing mechanisms to pockets of the conveyor, means at each transfer station for discharging individual eggs from each of the pockets in a group which has been advanced to that station by said conveyor and a control means for operating each said individual egg discharging means which includes a memory device having triggering means for said egg discharge means settable according to the weight registered on the weighing mechanisms so as to discharge eggs having the same weight characteristics at the proper transfer station.

3,928,185
PHENOLALDIMINES AS FROTH FLOTATION REAGENTS

Vojislav Petrovich, 1925 W. Schiller St., Chicago, Ill. 60622

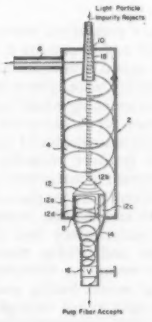
Filed Apr. 30, 1974, Ser. No. 465,411
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **5 Claims**

1. A method of beneficiating ores selected from the group consisting of oxide of iron, oxide, silicate, sulfide, arsenide, and antimonide of copper, nickel, and cobalt, the vanadates of heavy metals by froth flotation process to produce a froth concentrate of desired metal value, which comprises; effecting froth flotation of aforesaid ores in the presence of cresylaldimine adduct of cresylic acid as collector in a pulp of mineral slurry having a pH of 8 to 12; and recovering the desired metal value in an enriched froth concentrate, leaving a tailings poor in the desired metal value.

3,928,186
COMBINED PULP CLEANING SYSTEM INCLUDING HIGH AND LOW PRESSURE DROP HYDROCYCLONE CLEANERS

Rudolf Zemanek, Vancouver, Wash., assignor to Boise Cascade Corporation, Boise, Idaho

Filed July 24, 1973, Ser. No. 382,068
Int. Cl.² B04C *5/103*
U.S. Cl. 209—211 **9 Claims**



9. The method of separating from a suspension cellulose pulp fibers, and particles of impurities having a specific gravity lower than that of the pulp fibers, which comprises the steps of

a. introducing the suspension tangentially into an inlet opening arranged at the upper end of a totally cylindrical hydrocyclone chamber, said chamber having at its lower end a pulp fiber outlet opening and at its upper end a light impurity particle outlet opening, said suspension being introduced into said chamber at a pressure producing a pressure drop of about 5 psig. whereby the heavier pulp fiber particles are centrifugally displaced outwardly and flow downwardly in a helical path toward the bottom of the hydrocyclone chamber and wherein the lighter particles are displaced radially inwardly and downwardly in the chamber;

b. diverting the light impurity particles upwardly in a vortex toward the upper end of the hydrocyclone chamber by means of a conical diverter supported above the bottom wall of the chamber at an elevation above the pulp fiber outlet opening by means of a cylindrical support member having an outer diameter which corresponds with the maximum diameter of the conical diverter;

c. removing the pulp fibers adjacent the bottom of the chamber; and

d. removing the light impurity particles from the top of the chamber.

3,928,187

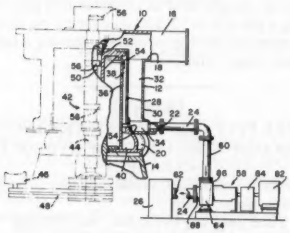
SUSPENSION FLOW CONTROL APPARATUS

Douglas L. G. Young, Lennoxville, Canada, assignor to Canadian Ingersoll-Rand Company Limited, Montreal, Canada

Filed Nov. 13, 1974, Ser. No. 523,345

Int. Cl.² B07B *1/18*

U.S. Cl. 209—255 **13 Claims**



1. In combination, a pressurized source of fluid-solid suspension, a receiver for said suspension at lower pressure than said source, conduit means interconnecting said source with said receiver for supplying suspension from said source to said receiver, and pressure reducing means operatively associated with said conduit means for reducing the pressure of suspension flowing from said source to said receiver through said conduit means, said pressure reducing means comprising chamber means interposed in said conduit means intermediate upstream and downstream portions thereof, rotor means operatively associated with said chamber means to cause its driven rotation to provide recirculatory flow of suspension within said chamber means, and driving means operatively connected to said rotor means for rotatably driving said rotor means, said chamber means having peripheral inlet means communicating with said source through said upstream portion of said conduit means for introducing suspension from said source into said chamber means adjacent the periphery thereof, and said chamber means having outlet means centrally of said rotor means connected to said receiver through said downstream portion of said conduit means for discharging suspension from said chamber means to said receiver.

3,928,188

SCREENING ARRANGEMENT

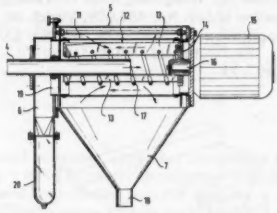
Otmar Link, Osterburken, and Rudi Baumann, Rosenberg, both of Germany, assignors to AZO-Maschinenfabrik Adolf Zimmermann, Germany

Filed Aug. 1, 1974, Ser. No. 493,961

Claims priority, application Germany, Aug. 1, 1973, 2338909

Int. Cl.² B07B *1/20*

U.S. Cl. 209—250 **27 Claims**



1. A material screening arrangement comprising: a cylindrical screen means, a rotor means disposed interiorly of said cylindrical screen means for directing material to be screened in a radially outward direction toward said cylindrical screen means, said rotor means including an axially extending internal free space for receiving the material to be screened, means for pneumatically conveying the material to be screened, a conveying conduit means for connecting the pneumatic conveying means with said internal free space, driving means disposed at one end of said rotor means for driving said rotor means, a discharge means for receiving the residue of the material to be screened, said discharge means being disposed at the end of said rotor means opposite said driving means, said conveying conduit means extending through said discharge means into said internal free space.

3,928,189

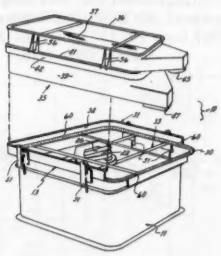
WEAR RESISTING HOLD-DOWN MEANS FOR SCREENING MACHINE

William E. Lower, and Edward K. Ivan, both of Cincinnati, Ohio, assignors to Rotex, Inc., Cincinnati, Ohio

Filed May 31, 1974, Ser. No. 474,979

Int. Cl.² B07B *1/46*

U.S. Cl. 209—405 **10 Claims**



9. In a screening machine having a screen assembly which is demountably seated on a peripheral planar mounting surface presented by a vibratory table having a vibratory drive to vibrate said table, and wherein clamps generally perpendicular to said surface are engaged between the table and the screen assembly and exert a clamping force holding the screen assembly on the said surface, there being an interface between the table and the screen assembly at said surface,

the improvement comprising,

a rim around said surface which is oversize with respect to the dimension of the screen assembly at the interface, and a layer of rigid, inelastic composite friction material extending for a substantial portion of said peripheral surface at the interface between the table and the screen assembly, the weight of the screen assembly being applied to the table through the composite material at the interface, the clamping force acting through the composite material in a direction generally perpendicular to it,

there being no mechanical abutment between the screen assembly and the vibratory table to restrain said screen assembly from movement in the plane of said surface, except through said composite material,

said material preventing relative motion between said screen assembly and said table at said interface which would occur in the absence of said material.

3,928,190

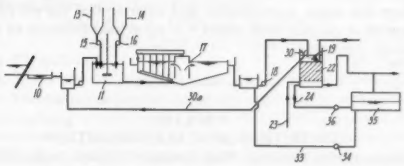
METHOD OF BIOLOGICAL PURIFICATION OF SEWAGE

Jean Louis Bebin, Reuil-Malmaison, France, assignor to Degremont, Societe Generale d'Epuration et d'Assainissement, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 307,635, Nov. 17, 1972, abandoned. This application July 26, 1974, Ser. No. 492,326

Int. Cl.[2] C02C *1/04*

U.S. Cl. 210—8 **6 Claims**



1. A process for purifying waste water containing organic pollution, said process comprising:

introducing said waste water into a flocculation tank, introducing into said flocculation tank as flocculation reagents at least one material selected from the group consisting of aluminum salts and iron salts in amounts which are nontoxic to protozoa and bacteria, and subjecting said waste water to the action of said flocculation reagents to eliminate from said waste water materials in suspension and colloidal material, thus forming flocculated water having dissolved pollutants therein;

providing a biological filter comprising a filter bed formed of a porous mass of granular material having on the surfaces thereon smooth zones capable of supporting a bacterial film and limited hollow zones capable of supporting a bacterial film and retaining such bacterial film even when said filter is subjected to severe backwashing, said step of providing said porous mass of granular material comprising burning clay with dextrin therein at approximately 900°C to form fragments having said surfaces of smooth and hollow zones and having a grain size of from 0.5 to 10 mm;

providing a reservoir area on the top surface of said filter; supplying said flocculated water into said reservoir area to immerse said filter in said flocculated water;

introducing air into said flocculated water in said reservoir area and thus aerating said flocculated water;

passing said flocculated water downwardly from said reservoir area into said filter to form a bacterial film on said smooth zones and hollow zones of said surfaces of said granular material, and thereby biologically purifying said flocculated water to form purified water;

removing said purified water from said filter; and

periodically performing a backwashing operation on said filter including:

injecting a washing liquid into said filter in a direction opposite to the direction of passage therethrough of said flocculated water;

removing said bacterial film from said smooth zones of said surfaces of said granular material;

retaining said bacterial film in said hollow zones of said surfaces of said granular material;

collecting said washing liquid and thus removed bacterial film; and

recycling said thus collected washing liquid and removed bacterial film into said waste water at a position upstream of said flocculation tank.

3,928,191

BIODEGRADATION OF METHANOLIC WASTE WATER

Irvin Joseph Belasco, Wilmington, Del., assignor to E. I. DuPont de Nemours & Co., Wilmington, Del.

Continuation of Ser. No. 295,662, Oct. 6, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,295

Int. Cl.[2] C02C *5/10*

U.S. Cl. 210—12 **1 Claim**

1. A process for purifying methanolic waste water having an organic content of about 0.7% by weight, at least 80% of which is methanol and including at least one of acetonitrile, acetaldoxime, acetonoxime, and acetohydroxamic acid, thiol-S-methyl ester, which comprises subjecting said water to the action of microbes in the presence of oxygen and dispersed, particulate attapulgite or montmorillonite clay, at a pH in the range of about 6 to 8 and temperature in the range of about 5° to 38°C., the average particle size of the clay being in the range of about 0.5 to 40 microns and the concentration of the clay being in the range of about 10 to 10,000 ppm.

3,928,192

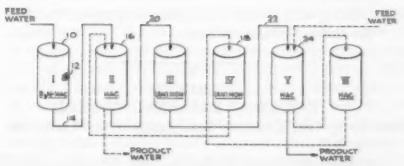
BUFFERED, WEAK ION-EXCHANGE WATER DEMINERALIZATION PROCESS

Arthur Katzakian, Jr., Sacramento, and David O. Depree, Loomis, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed June 6, 1974, Ser. No. 476,835

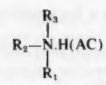
Int. Cl.[2] C02B *1/68, 1/76*

U.S. Cl. 210—30 **24 Claims**



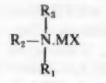
1. A process for demineralizing water comprising the steps of:

passing an amine buffer through a bed of weakly acidic cation exchange resin in hydrogen form to form a first bed containing an amine salt of the cation resin of the formula:



where H(AC) is the cation resin and R_1 is selected from the group consisting of alkyl, alkynyl, alkenyl, aryl, alkaryl, aralkyl, and alkoxy and may be substituted with hetero atoms or groups such as hydroxyl, ether, halogen or cyano; R_2 and R_3 are hydrogen or R_1; or R_2 and R_3 may be linked to form a cyclic structure;

passing feedwater containing mineral salts, of the formula MX, through said first amine salt bed and ionically exchanging the metal ion of the salt with the amine of the resin salt to form a first effluent containing an amine salt of the formula:



passing the first effluent through a second bed of weakly basic anion exchange resin and depositing the mineral anions thereon to form a second effluent containing said amine buffer, wherein the pK values of the cation exchange resin and anion exchange resin are between 3 and 7.5.

3,928,193

PROCESS FOR LARGE SCALE CHROMATOGRAPHY

Asko J. Melaja; Lauri Hämäläinen, and Lasse Rantanen, all of Kantvik, Finland, assignors to Suomen Sokeri Osakeyhtio (Finnish Sugar Company), Helsinki, Finland

Filed Feb. 14, 1975, Ser. No. 550,026
Int. Cl.² B01D *15/08*
U.S. Cl. 210—31 C **4 Claims**

1. A method for accomplishing chromatographic separation using ion-exchange resin in cylindrical, baffle-free chromatographic columns having a diameter in excess of about 1 meter and a height of from about 2.5 to about 5 meters which comprises the steps of

1. packing the column with a particulate ion-exchange resin to provide a bed having a permeability coefficient k of from about 1×10^{10} to about 4×10^{10} $1/m^2$,
2. saturating the column with water and back-washing to provide uniform packing of resin,
3. introducing the liquid to be chromatographically separated evenly across the column while initiating uniform flow of said liquid down through the column at a velocity of flow equal to 0.5 – 2 times the critical velocity of the system, and
4. eluting with water to recover successive fractions from the bottom of the column.

3,928,194

EMULSION BREAKING METHOD

Fan-Sheng Tao, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 301,020, Oct. 26, 1972, abandoned. This application Aug. 23, 1974, Ser. No. 499,887
Int. Cl.² B01D *17/04*
U.S. Cl. 210—43 **20 Claims**

1. A method for converting a water in oil emulsion into an oil in water dispersion at ambient temperature which may then be allowed to settle and separate into substantially separate oil and water phases comprising:

mixing a mixture comprising a water in oil emulsion, an amount of water sufficient to effect inversion of the emulsion and an effective amount of a demulsifier selected from the group consisting of oxyalkylated amines, salts of alkyl-aryl sulfonic acid, oxyalkylated phenolic resins, polymeric amines, glycol esters, polyoxyalkylated glycol esters, polyoxyethylated glycol esters, fatty acid esters, polyoxyethylated glycol esters, fatty acid esters, oxyalkylated polyols, oxyalkylated glycols sufficient to form an oil in water dispersion.

3,928,195

LIQUID PURIFYING PROCESS

James B. Hoeltgen, and Harold E. B. Humphrey, both of East Lansing, Mich., assignors to Kelmik, Inc., East Lansing, Mich.

Continuation-in-part of Ser. No. 317,798, Dec. 22, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,614
Int. Cl.² C02B *1/20*
U.S. Cl. 210—49 **14 Claims**

1. A process for purifying a waste water system comprising the steps of: forming filterable solids by sequentially adding to the waste water system, with agitation in the waste water system, first from about 0.004 to 0.04 moles of an alkali aluminate per liter of said waste water system, secondly from about 0.006 to 0.2 moles of an alkali silicate per liter of said waste water system, and third from about 0.001 to 0.2 moles of at least one of (a) a soluble ammonium ion source and (b) a soluble di- or trivalent cation source, selected from the group consisting of the cations of calcium, magnesium, iron, aluminum, barium, cobalt, cadmium, strontium and copper, per liter of said waste water system, followed by filtering the solids from the waste water system; and insuring that the pH of the system is greater than about 5.5 upon said addition of said alkali aluminate.

3,928,196

INHIBITION OF SCALE DEPOSITION

Leonard John Persinski; Paul Hotchkiss Ralston, both of Pittsburgh, and Robert Cornelius Gordon, Jr., Rochester, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Dec. 5, 1973, Ser. No. 421,900
Int. Cl.² C02B *5/06*
U.S. Cl. 210—58 **2 Claims**

1. A method of inhibiting the precipitation of scale forming salts in an aqueous system comprising adding from 1 to 100 ppm of a copolymer having a molecular weight in the range of from about 1,000 to about 10,000 wherein said copolymer contains from about 5 to about 75 mole % of 2-acrylamido-2-methylpropyl sulfonic acid and from about 95 to about 25 mole % of acrylic acid.

3,928,197

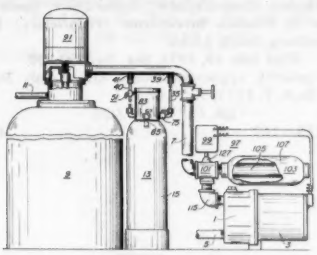
POLLUTION CONTROL SYSTEM FOR WATER SUPPLY

Raymond E. Horan, Jr., and Floyd M. Nash, both of Little Rock, Ark., assignors to Jacuzzi Bros. Incorporated, Little Rock, Ark.

Continuation of Ser. No. 93,770, Nov. 30, 1970, abandoned. This application Feb. 14, 1974, Ser. No. 442,360
Int. Cl.² C02B *3/08*
U.S. Cl. 210—62 **2 Claims**

1. The method of supplying safe and palatable water to service from a water system having a pump, coupled to a source of contaminated water and a service line, comprising predetermining the degree of contamination of said water, then determining a ratio of flow rate of an added disinfectant to flow rate of said water which will, after an exposure period of time, render said water safe without rendering said water unpalatable, supplying said disinfectant to said water in such system at substantially said aforementioned ratio of disinfectant flow rate to water flow rate, despite changes in flow rate of water, by-passing a part of said flow through a container parallel with said service line and having a collapsible bag

therein, said bag being compressed to deliver said disinfectant in said ratio, and retaining said disinfectant in contact with



said water, before discharge to service, for at least a period of time equal to said exposure time.

3,928,198
SYNERGISTIC COMPOSITIONS CONTAINING 2,2-DIBROMO-3-NITRILOPROPIONAMIDE AND 3,3,4,4-TETRACHLOROTETRAHYDROTHIOPENE-1,1-DIOXIDE AND THEIR USE

Robert H. Brink, Jr., Doylestown; Bernard F. Shema, Glenside, and Paul Swered, Philadelphia, all of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

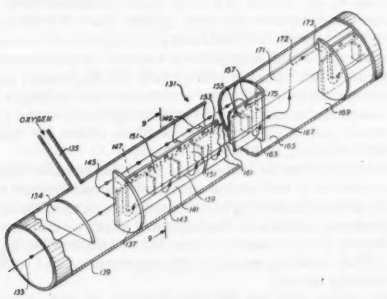
Filed Mar. 6, 1975, Ser. No. 555,776
Int. Cl.[2] A01N *9/12*; **C02B** *3/06*
U.S. Cl. 210—62 **10 Claims**

4. A method for controlling the growth of the microorganism Aerobacter aerogenes in an aqueous system which comprises adding to said system a growth inhibiting amount of a composition comprised of 2,2-Dibromo-3-nitrilopropionamide and 3,3,4,4-Tetrachlorotetrahydrothiophene-1,1-dioxide wherein the weight ratio of the amide to the dioxide ranges from about 95:5 to about 35:65 respectively.

3,928,199
GAS ABSORPTION SYSTEM AND METHOD

Bradley S. Kirk, Plainfield, and Raymond M. Chappel, Mendham, both of N.J., assignors to Airco, Inc., Montvale, N.J.

Division of Ser. No. 181,785, Sept. 20, 1971, Pat. No. 3,826,742. This application Apr. 10, 1974, Ser. No. 459,496
Int. Cl. C02b *3/08*
U.S. Cl. 210—63 **8 Claims**



1. Apparatus for dissolving a gas in a liquid comprising a conduit having an inlet and an outlet and a weir arranged longitudinally therein, first baffle means disposed at either end of said weir for directing a flow of said liquid from said inlet over said weir, second baffle means spaced away from said weir for defining a gravitational fall zone in said conduit substantially coextensive with said weir thereby enabling formation of a highly turbulent froth column of bubbles in said fall zone; and means for injecting said gas into said conduit at a controlled rate to establish a gas enriched space in said conduit in contact with said liquid falling over said weir and said froth column in said fall zone to thereby effect the dissolution of at least a portion of said gas in said liquid.

7. A method of increasing the oxygen content of a liquid stream flowing through

a plurality of enclosed gravitational fall zones each having an inlet and an outlet linking separate liquid levels therebetween with the outlet of one of said enclosed fall zones interconnected through conduit means to the inlet of a succeeding enclosed fall zone means, and comprising the steps of:

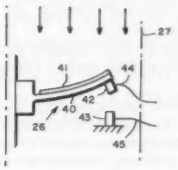
injecting oxygen at a controlled rate to provide and maintain an oxygen enriched gas space in each of said enclosed fall zones; and

subjecting said stream to successive unconfined free falls through said plurality of enclosed fall zones at a superficial flow velocity within the range of about 0.5 ft./sec. to 2.0 ft./sec. and at a flow rate substantially independent of the rate at which oxygen is injected with each fall zone being of sufficient height to generate and maintain by free fall of said stream, a highly turbulent froth column of bubbles extending upwardly in each of said fall zones whereby a high rate of oxygen transfer into said liquid stream is enabled.

3,928,200
DETECTION DEVICES FOR USE IN SOLUTION PROCESSING SYSTEMS

Calvin Calmon, Birmingham, N.J., assignor to Water Purification Associates, Cambridge, Mass.

Filed Dec. 19, 1974, Ser. No. 534,466
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—96 **13 Claims**



1. A detection device for use in a solution processing system, said device comprising

a sensing element including

a first ion-exchange material the dimensions of which vary as a function of the salt concentration of said solution and as a function of the valence of ions present in said solution when said element is in contact with said solution, said first material having maximum dimensions when it is in contact with a solution having mono-valent ions whereby said sensing element is in its unflexed state and having reduced dimensions when it is in contact with a solution having multi-valent ions whereby said sensing element is in its flexed state and said first material further having its maximum dimensions when it is in contact with a salt solution having a relatively low salt concentration whereby said sensing element is in its unflexed state and having reduced dimensions when it is in contact with a salt solution having a relatively high salt concentration whereby said sensing element is in its flexed state;

a second, substantially flexible, solid material having substantially fixed dimensions which are retained in the presence of said solution independently of the salt concentration thereof and the valence of ions therein;

said first material being in contact with a surface of said flexible, solid material,

whereby dimensional changes of said first material which occur when said first material is in contact with said solution cause a flexing of said sensing element due to the flexing of said second material.

3,928,201

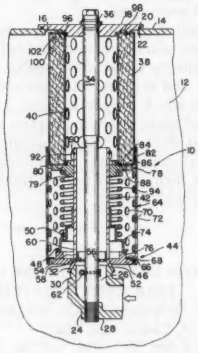
FILTER MOUNTING AND BYPASS VALVE ASSEMBLY

John A. Junck, Joliet, and Eugene E. Latimer, Wilmington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 8, 1974, Ser. No. 495,589

Int. Cl.² B01D 27/10

U.S. Cl. 210—132 **6 Claims**



1. A filter assembly comprising:

a housing having an opening for receiving a filter element, cover enclosing said opening, and including fluid inlet and outlet means;

an annular filter element mounted within said housing adjacent and having one end in engagement with the end cover;

enlarged conduit means for directing fluid from the fluid inlet means through the filter element;

valve means mounted on one end of said conduit means and comprising a valving element movable to a first position away from the filter element so that the fluid-directing means direct fluid from the fluid inlet means through the filter element, and movable away from the first position toward the filter element to allow fluid to flow from the fluid inlet means to the fluid outlet means, bypassing the filter element;

annular support means including seal means mounted on said conduit means for engaging and supporting the other end of said filter element;

said annular support means consisting of an inner hub member slidably mounted on said enlarged conduit means,

a radially extending flange extending outwardly from said hub and integral therewith,

an annular groove separating one side of said flange into inner and outer annular supporting surfaces engaging said other end of said filter element, and, vent ports extending from the groove to the other side of said flange; and,

resilient means interposed between the valving element and the annular support and seal means, the valving element being biased thereby into said first position and movable toward the filter element against the resilience thereof, the valve means being subjected to the fluid pressure of the fluid introduced through the fluid inlet means to the filter element, so that the valving element moves toward the filter element upon increased fluid pressure built up in the filter element.

3,928,202

APPARATUS FOR CLEANING THE SURFACE OF A LIQUID

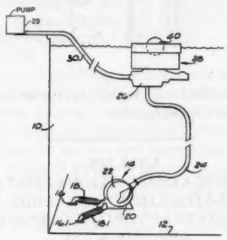
Johann Nicolaas Raubenheimer, Bedfordview, South Africa, assignor to Peacock Investments (Proprietary) Limited, Johannesburg, South Africa

Filed July 19, 1974, Ser. No. 490,030

Claims priority, application South Africa, July 26, 1973, 73/5112; Sept. 7, 1973, 73/7147

Int. Cl.² E04H 3/20

U.S. Cl. 210—169 **4 Claims**



1. Apparatus operative in a tank having sidewalls and a bottom for cleaning the bottom of the tank and the surface of a body of liquid within the tank comprising

a pump located near the sidewall of the tank for withdrawing liquid therefrom,

first flexible conduit means in fluid communication with said pump and with liquid surface cleaning means for floating on the surface of the body of liquid,

second flexible conduit means with a first end connected to said liquid surface cleaning means and a second end in fluid communication with tank bottom cleaning means, said conduit first end being in fluid communication with said first flexible conduit means at its end connected to said liquid surface cleaning means,

said liquid surface cleaning means including a float supported chamber with filter means located therein for collecting debris from the surface of the body of liquid, inlet means in a sidewall of said chamber in fluid communication with an inlet side of said filter means, turbine blade means located in a lower region of said chamber for operating impeller means to induce liquid flow through said inlet means into said filter means and out of an outlet constructed and arranged in a sidewall of said chamber, second inlet means in said surface cleaning means separated from said outlet and constructed and arranged for said pump to cause liquid flow through said second inlet means and against said turbine blade means for operatively rotating said impeller means,

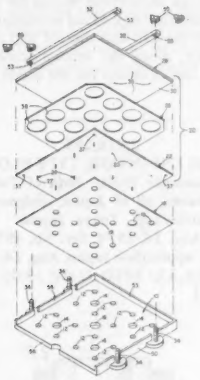
said tank bottom cleaning means including chamber means connected to said second end of said second conduit, said chamber means being constructed and arranged for being randomly pulled over the bottom of a tank by said second flexible conduit means connected to said floating liquid surface cleaning means by the movement of said surface cleaning means,

inlet means provided into the interior of said chamber means of said tank bottom cleaning means whereby liquid near the bottom of the tank induced to flow into said inlet means of said chamber means by the suction of said pump communicated to said bottom cleaning chamber means through said first and second flexible conduit means removes debris from the bottom of a tank for discharge through said pump.

3,928,203
CHROMATOGRAPHIC APPARATUS

Richard D. Kremer, Keene, N.H., assignor to Schleicher & Schuell, Incorporated, Keene, N.H.

Filed Mar. 27, 1975, Ser. No. 562,490
Int. Cl.² B01D *15/08*
U.S. Cl. 210—198 C **6 Claims**



1. Chromatographic apparatus for developing chromatograms on the stationary layer of a TLC plate spotted at predetermined sample positions with one or more samples, said apparatus comprising

a base providing solvent wells in a predetermined pattern, each open at the upper surface of the base so as to face the adsorbent surface of the TLC plate when the latter is positioned in the apparatus,

selection means adapted to be held between said base and said TLC plate to select solvent wells corresponding in number and position to the positions of said samples, said means comprising

a wick holding plate arranged to be held between said base and said TLC plate and having holes corresponding both in number and position to the aforesaid sample positions and corresponding wells,

said plate being adapted to hold wicks in said holes, each wick having a solvent take-up portion for dipping in a well and a sample contacting portion for contacting a sample, and

a spacing and sealing layer between said wick holding plate and said TLC plate, said layer including a spacing aperture having a periphery surrounding each said sample contacting portion and spaced therefrom to define a development chamber bounded by portions of said last named plates and said periphery, and

pressure means arranged to urge said plates together to seal each said chamber and to maintain said TLC plate in developing contact with each said wick sample contacting portion,

whereby each wick will transport solvent from its solvent well through its development chamber to a sample for development thereof.

3,928,204
INTERCONNECTORS FOR SPIRAL-WOUND FILTRATION MODULES

Frank A. Thomas, 309 Reese St., Greenwood, Wis. 54437

Filed June 27, 1974, Ser. No. 483,628
Int. Cl.² B01D *31/00*
U.S. Cl. 210—232 **13 Claims**

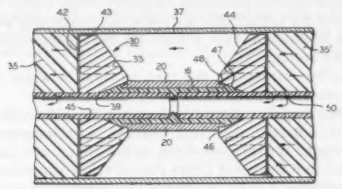
1. A filtration apparatus comprising:

at least one pressure vessel;

a plurality of spiral-wound ultrafiltration modules serially arranged within each vessel, each of said modules including a filtration membrane spirally wound about a permeate collection tube, said tubes extending beyond the ends of said wound membrane; and

means interconnecting and sealing adjacent ends of said permeate tubes comprising:

a. a cylindrical sleeve surrounding and overlapping said adjacent ends and having an inside diameter exceeding the outside diameter of said tubes, and

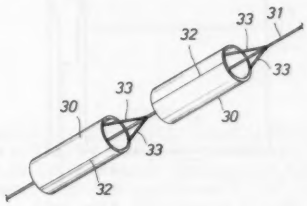


b. a resilient liner for said sleeve having a first portion bonded to the inner surface of said sleeve and a cylindrical interior surface having a diameter only slightly greater than the outside of said tubes whereby said tubes fit snugly within said lined sleeve, and wherein said liner is longer than said sleeve and includes end portions extending beyond the ends of said sleeve and engaging said tubes, whereby when pressure is increased in said vessel said end portions seal against said tubes.

3,928,205
REMOVAL OF FLOATING POLLUTANTS

Errol V. Seymour, and Ray R. Ayers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 367,037, June 4, 1973, abandoned, which is a continuation of Ser. No. 147,934, May 28, 1971, abandoned. This application May 17, 1974, Ser. No. 470,888
Int. Cl.² E02B *15/04*
U.S. Cl. 210—242 **1 Claim**



1. An apparatus for removing a floating liquid pollutant from water, comprising:

a tension member;

a sorbent tube shaped as an open cylinder through which the tension member passes and having a lateral split so that it may be removed off the tension member in the event of failure of the sorbent;

lines connecting the tube to the tension member;

means to deploy the tension member to position the sorbent tubes in contact with the pollutant; and

means to remove the pollutant from the sorbent.

3,928,206
APPARATUS FOR THE COLLECTION OF BUOYANT FOREIGN MATTER

Frank Arthur Oakley Waren, 301 A Kingsway, Hove, Sussex, England

Continuation-in-part of Ser. No. 217,058, Jan. 11, 1972, abandoned. This application July 18, 1974, Ser. No. 489,811

Claims priority, application United Kingdom, Jan. 21, 1971, 2898/71The portion of the term of this patent subsequent to Aug. 8, 1989, has been disclaimed.

Int. Cl.[2] E02B *15/04*

U.S. Cl. 210—242 **23 Claims**

1. Apparatus for collecting buoyant foreign matter floating on or near the surface of a body of water comprising a collecting tank having side walls, a rear wall and a substantially open front and bottom,

means for supporting the tank to float in water with its upper edge above water level,

a vaned impeller extending between the side walls of the tank adjacent the front thereof, said impeller being mounted for rotation about an horizontal axis positoned such that the lower vanes extend below water level, and a non-return valve positioned downstream of said impeller, said valve comprising a plate extending between the said side walls, said plate having a lower edge pivotally mounted on a horizontal axis positioned below water level and an upper edge supported to extend somewhat above water level by at least one float.

3,928,207
APPARATUS FOR SEPARATING PARTICULATE SOLIDS FROM LIQUIDS

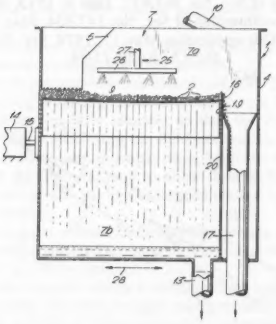
Peter Frederick Wace, Oxford; Claude Lewis Stockwell, Newbury, and Peter James Alder, Abingdon, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Apr. 4, 1974, Ser. No. 458,044

Claims priority, application United Kingdom, Apr. 9, 1973, 17002/73

Int. Cl. B01d *35/20*

U.S. Cl. 210—252 **4 Claims**



1. Apparatus for the separation of particulate solids from a liquid, the apparatus comprising a box, a longitudinally extending vertical partition within the box providing first and second chambers side by side within the box, first and second liquid draining screens dividing the first and second chambers respectively into upper and lower compartments, said screens having longitudinally spaced entry and exit ends adjacent the ends of said vertical partition, said screens being laterally disposed such that the entry end of the first screen is laterally adjacent the exit end of the second screen but separated therefrom by said vertical partition, means for feeding a mixture of particulate solids and liquid onto the entry end of the first screen for movement to the exit end, a first weir formed by a part of the vertical partition of reduced height disposed at the exit end of the first screen and projecting above the first screen for allowing the controlled passage of the solids transversely thereover from the exit end of the first screen onto the entry end of the second screen, a second weir disposed at the exit end of, and projecting above, the second screen for allowing controlled passage of the solids thereover, means for withdrawing liquid from the lower compartments of the chambers after passage through the screens, means for vibrating the box so as to cause generally longitudinal movement of solids along the first screen to the exit end thereof and then transversely over the first weir, along the second screen and over the second weir, and outlet means for the solids which pass over the second weir.

3,928,208
CORE BODY FOR USE IN COIL TYPE BLOOD DIALYZER

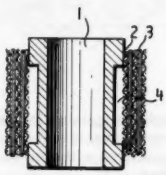
Shiro Morita; Konosuke Fujiki, both of Tokyo, and Kazuo Takeda, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,390

Claims priority, application Japan, Aug. 14, 1973, 48-91055

Int. Cl.[2] B01D *31/00, 13/00*

U.S. Cl. 210—321 **4 Claims**



1. In a coil type blood dialyzer characterized by a core body having a membrane supporting member and a dialyzing tubular membrane coiled thereabout in sandwiched relation to each other, the improvement comprising:

said core body being of tubular configuration and having a circumferential channel of substantial axial length formed in the outer periphery thereof, thereby forming a spool-like structure having a radially outwardly extending flange at each end, and wherein the axial length of said channel is smaller than that of the supporting member, such that the supporting member is supported on said flanges in spaced relation from the base of said channel.

3,928,209
LAMINATED SETTLER

Holger Gustaf Engdahl, and Raimo Johannes Parviainen, both of Savonlinna, Finland, assignors to Enso-Gutzeit Osakeyhtio, Helsinki, Finland

Filed Sept. 3, 1974, Ser. No. 502,499

Int. Cl.[2] B01D *21/00*

U.S. Cl. 210—519 **4 Claims**

1. A laminated settler for settling solids present in a liquid in a tank, into which the liquid to be settled is fed, said settler comprising

a tank having upper and lower end portions,

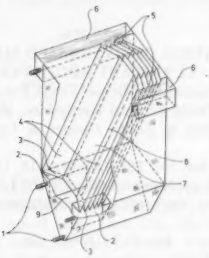
a plurality of laminae positioned in said tank in a slanted relation to the vertical and in spaced parallel relation to each other to define compartments therebetween in which the liquid to be settled flows,

said laminae each having a flat surface portion and an inclined surface portion which extends angularly to the flat surface portion generally laterally of the direction of flow of liquid through said compartments;

a feeding groove in the lower end portion of the tank open only to said compartments between the laminae at the

laterally inclined surface portions thereof, said groove having an upper discharge edge located at the same level in the tank as the lower edge of the laminae and extending across only the surfaces laterally inclined surface portions of the laminae,

said upper end portion of the tank having an outlet opening at substantially the same level as the upper ends of the laminae and collecting troughs at the upper end portion of the tank adjacent said outlet opening and the upper ends of the laminae for receiving liquid, from which the sediment has been removed, as an overflow through said outlet opening from the compartments between the laminae, and



a sediment receiving chamber in the lower end portion of the bank for receiving sediment from the liquid, said sediment receiving chamber extending laterally further than said feeding groove,

said tank having an inlet opening through which liquid is supplied to said groove and an outlet opening for removal of sediment from said receiving chamber,

whereby particles settling out of liquid supplied from said groove to the compartments between the laminae are deflected by the inclined surface portions of the laminae towards the flat surface portions thereof to avoid conflict with first liquid supplied from the groove to said inclined surface portions of the laminae.

3,928,210

FIRE PROTECTIVE COMPOSITION FOR USE WITH ELECTRICAL CABLES

Roger L. Peterson, Los Angeles, Calif., assignor to The Dyna-Therm Corporation, Sun Valley, Calif.

Continuation of Ser. No. 218,237, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 880,813, Nov. 28, 1969, Pat. No. 3,642,531. This application Oct. 1, 1974, Ser. No. 510,887

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **14 Claims**

1. A self-extinguishing fire protective composition for the coating of electrical cables containing from about **45** to about **80** weight percent total solids, based on the total weight of said composition, said composition consisting essentially of from about 4 to about 45 weight percent emulsion solids of a water based resinous emulsion selected from the group consisting of polyvinyl acetate emusions, GRS rubber, natural rubber latex, methacrylate and acrylate resins and copolymers thereof, elastomeric polyurethanes, polyvinyl chloride, polyvinylidene chloride, polyvinyl chloride and polyvinylidene chloride copolymers, vinyl acetate and vinyl chloride copolymers, polyvinyl acetate and ethylene copolymers, water emulsified epoxy resins, polystyrene and acrylonitrile-butadiene-styrene polymers, said resinous emulsion binding said composition upon application to electrical cables in a flexible cohesive structurally integral protective coating, about 1 to about 15 weight percent of a compound containing organically bound halogen selected from the group consisting of halogenated hydrocarbons, tetrabromophthalic anhydride, tris (2,3-dibromopropyl) phosphate, trisbetachloroethyl phosphate and chlorinated biphenyl to impart flame retarding properties to said composition, about 5 to about 50 weight percent of non combustible fibers, said fibers remaining in place about an electrical cable during a fire after said binder decomposes and reinforcing and maintaining the physical integrity of a protective coating formed from said composition upon application to electrical cables, about 1 to about 20 weight percent of a plasticizer for said water based resinous emulsion, and from about 0.5 to about 15 weight percent of an antimony oxide containing compound, said composition forming a coherent structurally integral fibrous reinforced self-extinguishing fire protective coating about the surface of electrical cables after application to the same to prevent the spread of a fire from its place of origin without affecting adversely the ampacity of such coated cables.

3,928,211

PROCESS FOR SCAVENGING HYDROGEN SULFIDE IN AQUEOUS DRILLING FLUIDS AND METHOD OF PREVENTING METALLIC CORROSION OF SUBTERRANEAN WELL DRILLING APPARATUSES

William C. Browning, and Homer F. Young, both of Harris County, Tex., assignors to Milchem Incorporated, Houston, Tex.

Continuation of Ser. No. 82,866, Oct. 21, 1970, abandoned. This application Dec. 30, 1974, Ser. No. 537,243

Int. Cl.² C09K *7/04*

U.S. Cl. 252—8.5 B **4 Claims**

1. In the process of preventing corrosion of metallic subterranean well drilling apparatuses exposed to an aqueous alkaline drilling fluid having a pH at least as high as about 9.0 and contaminated by hydrogen sulfide, the step of removing hydrogen sulfide from said fluid with a hydrogen sulfide scavenger consisting essentially of basic zinc carbonate, said scavenger being added to said drilling fluid in an amount of at least about 1 p.p.b.

3,928,212

HARMLESS SOFTENING AGENT FOR FABRICS HAVING EXCELLENT MOISTURE ABSORBABILITY

Sumio Goto, Uji, and Kazuhiko Ishihara, Kyoto, both of Japan, assignors to Dai-ichi Kogyo Seiyaku Co., Ltd., Japan

Filed July 6, 1973, Ser. No. 377,136

Claims priority, application Japan, July 12, 1972, 47-70282

Int. Cl.² D06M *13/16*

U.S. Cl. 252—8.6 **5 Claims**

1. A softening agent for giving excellent softness and moisture absorbability to fabrics consisting of 5 to 50% by weight of a natural fat and oil or the hardened product thereof selected from the group consisting of beef tallow, cotton seed oil, soybean oil and coconut oil and 95 to 50% by weight of at least one of polyvalent alcohol fatty acid esters selected from the group consisting of sugar fatty acid ester, sorbitan fatty acid ester, glycerin fatty acid ester and propylene glycol fatty acid ester wherein the fatty acid moiety has 12 to 18 carbon atoms; said polyvalent alcohol fatty acid ester including at least 10% by weight of monoester on the basis of the total weight of the fatty acid ester.

3,928,213
FABRIC SOFTENER AND SOIL-RELEASE COMPOSITION AND METHOD

Robert Dwight Temple; Vincent Paul Heuring, both of Cincinnati, Ohio, and James Bruce Prentice, Batesville, Ind., assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 344,389, March 23, 1973, abandoned. This application June 29, 1973, Ser. No. 375,218

Int. Cl.² D06M *13/46*

U.S. Cl. 252—8.8 **10 Claims**

1. A liquid fabric softener composition having a viscosity of less than about 250 centipoises and effective to provide fabrics with softening and anti-soiling properties consisting essentially of:

A. from about 2% to about 15% by weight of a cation-active fabric softener compound having from one to two straight-chain organic groups of from 8 to 22 carbon atoms;

B. from about 0.1% to about 10% of a soil release agent selected from the group consisting of hydroxyalkyl alkyl cellulose and alkyl cellulose where each alkyl has from 1 to 3 carbon atoms, said soil release agent providing a viscosity of less than about 400 centipoises determined at a two percent by weight concentration in water at 20°C;

C. from 0 to about 2% of an emulsifier selected from the group consisting of

1. the condensation product of one mole of alkylphenol wherein the alkyl chain contains from about 8 to about 18 carbon atoms with from about one to about 100 moles of ethylene oxide,

2. the condensation product of one mole of an aliphatic alcohol wherein the alkyl chain contains from about 10 to about 24 carbon atoms with from about 1 to about 100 moles of ethylene oxide,

3. polyethylene glycol having a molecular weight of from about 1400 to about 30,000,

4. mixtures thereof; and

D. the balance water.

3,928,214
GREASE COMPOSITION

Reishi Naka; Shigeki Komatsuzaki; Tomotsuna Tomobe, all of Hitachi, Japan, and Yoshihiro Moniwa, deceased, late of Hitachi, Japan (by Yoshiko Moniwa, administratrix), assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 247,384, April 25, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 445,892

Int. Cl.² C10M *1/10, 1/32, 3/10, 3/24*

U.S. Cl. 252—11 **52 Claims**

1. A grease composition consisting essentially of a mineral oil having a dynamic viscosity of 50 to 600 centistokes at 37.8°C. (100°F.) and a pour point higher than −30°C. and a wax poor in solubility in the mineral oil and dispersed in the mineral oil having a molecular weight of 300 to 1,000 and a melting point higher than 100°C. in an amount larger than the solubility limit thereof in the mineral oil and sufficient to provide the consistency of 200 to 330 at room temperature with the grease composition.

3,928,215
HIGH FLUIDITY CUTTING OILS WHICH EXHIBIT RETRO-VISCOUS PROPERTIES

Karl D. Dreher, Littleton, Colo., and William B. Gogarty, Findlay, Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 375,293, June 29, 1973, abandoned. This application Sept. 10, 1973, Ser. No. 395,673

Int. Cl.² C10M *1/40, 3/34*

U.S. Cl. 252—33.3 **14 Claims**

1. In a process of machining metal wherein a cutting oil comprised of about 30 to about 70% of a liquid hydrocarbon, about 15 to about 66% of water, about 4 to about 15% of an anionic surfactant having an average equivalent weight of 350 to about 525 or a carboxylate having an average equivalent weight of about 200 to about 500, and optionally containing about 0.001 to about 20% of a cosurfactant, the percents based on weight, is used, the improvement comprising using as the cutting oil a composition containing lamellar micelles having an axial ratio of at least about 3.5 and the cutting oil also exhibiting retro viscous properties.

3,928,216
PREPARATION OF OVERBASED MAGNESIUM LUBRICANT ADDITIVES

Peter Anthony Saunders; Michael Frank Fox; Anthony Francis Fagan, and Philip Edward Derbyshire, all of London, England, assignors to Edwin Cooper & Company, London, England

Division of Ser. No. 257,424, May 26, 1972, Pat. No. 3,857,790. This application Sept. 27, 1974, Ser. No. 510,038

Claims priority, application United Kingdom, May 27, 1971, 17604/71

Int. Cl.² C10M *1/40*

U.S. Cl. 252—33.4 **22 Claims**

1. In a process for preparing a magnesium overbased lubricant additive wherein a reaction mixture of an oil soluble detergent or dispersant susceptible to overbasing selected from the group consisting of phosphosulphurized hydrocarbons, metal salts of carboxylic acids, sulphonic acids and metal salts of sulphonic acid, a basic magnesium compound in an amount sufficient to overbase said oil soluble detergent or dispersant, and a reaction promoting amount of a hydroxy-containing compound selected from the group consisting of alcohols and monoethers of glycols is formed in an inert solvent, said reaction mixture is contacted with an acidic gas at a reaction temperature of from about 20°C up to the decomposition temperature of the reaction mixture and the resultant product is heated to remove volatile components; the improvement comprising: incorporating in said reaction mixture a reaction promoting amount, up to about 40% by weight based on the weight of the inert solvent, of a salt of boric acid and an aliphatic hydrocarbyl diamine or polyamine containing from 2 to 8 carbon atoms.

3,928,217
LUBRICATING COMPOSITIONS

Yves Labat, Pau; Yvon Mordelet, Chuzelles, and Jean Baptiste Signouret, Pau, all of France, assignors to Entreprise de Recherches et d'Activites Petrolieres (ELF), Paris, France

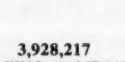
Filed Oct. 10, 1973, Ser. No. 404,887

Claims priority, application France, Oct. 19, 1972, 72.37129

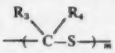
Int. Cl.² C10M *1/38, 3/32*

U.S. Cl. 252—45 **10 Claims**

1. A high pressure lubricating oil composition comprising oil and as an additive therefor, a heterocyclic compound consisting of



groups arranged consecutively or alternatively with



groups to form the heterocyclic ring such that there is no more than one carbon atom between sulfur atoms in the heterocyclic ring so formed, wherein n is 1–4 and m is 0–4, R_1, R_2, R_3 and R_4 are individually selected from the group consisting of hydrogen, alkyl of 1–6 carbon atoms, alkenyl of 1–6 carbon atoms, sulfur-containing alkyl of 1–6 carbon atoms, sulfur-containing alkenyl of 1–6 carbon atoms, and wherein R_1 and R_2, and R_3 and R_4, respectively, can form with the carbon atom to which they are joined, a saturated, unsaturated or sulfur-containing ring of 4–8 carbon atoms, and wherein said additive is 0.5–15 weight percent of said composition.

3,928,218
LUBRICANT AND CLEANING COMPOSITION FOR PRECISION INSTRUMENTS

Charles S. Rowe, late of Lake Park, Fla. (by Doris D. Rowe, executrix), and Alvin C. Pyles, North Palm Beach, Fla., assignors to Doris D. Rowe, Lake Park, Fla., a part interest

Division of Ser. No. 277,257, Aug. 2, 1972, Pat. No. 3,791,488, which is a continuation-in-part of Ser. No. 34,597, May 4, 1970, abandoned. This application Nov. 12, 1973, Ser. No. 414,760

Int. Cl.² C10M *1/10, 1/50*

U.S. Cl. 252—49.6 **6 Claims**

1. A composition for lubricating complex mechanisms and protecting same from the elements consisting essentially of a highly refined mineral oil having the general formula C_nH_{2n+2}, a viscosity index of about 100 to 150, a viscosity at 10°F. of about 10–50 centistokes and a pour point in the range from about −10° to 20°F, a dimethyl siloxane polymer having a viscosity in the range from about 500 to 1500 centistokes at 77°F., said polymer being chemically inert to said mineral oil and to the materials constituting said complex mechanism, and a solvent for said mineral oil and said polymer, said polymer and said mineral oil being present in approximately equal proportions and having a proportion by volume of polymer and mineral oil to solvent in the range from 1:8 to 1:64.

3,928,219
LUBRICATING OIL COMPOSITIONS OF IMPROVED RUST INHIBITION

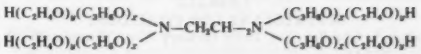
Andrew G. Papay, Manchester; Brian W. Matthews, Crestwood, both of Mo., and Arthur S. Thomas, Wokingham, England, assignors to Edwin Cooper, Inc., St. Louis, Mo.

Filed Aug. 24, 1973, Ser. No. 391,469

Int. Cl.² C10M *1/32;* **C09K** *50/00*

U.S. Cl. 252—51.5 R **5 Claims**

1. In a lubricating composition comprising a major amount of an oil of lubricating viscosity and conventional additives selected from the group consisting of internal combustion engine oil additives, gear oil additives and hydraulic oil additives in an amount sufficient to effect each additives attendant function, the improvement comprising as a further additive from 0.01 to 5.0 percent of a tetra poly (oxyethylene) - poly (oxypropylene) derivative of ethylenediamine having the formula,



wherein x and y are so selected that said derivative has a molecular weight in the range of from about 1650 to 15,000 and a poly(oxyethylene) content of about 10 to 50%.

3,928,220
PREPARATION OF HYDROCARBON-DISPERSIBLE MAGNETIC MICROSPHEROIDS IN POWDERED FORM

George M. J. Slusarczuk, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1973, Ser. No. 391,580

Int. Cl.² C04B *35/26*

U.S. Cl. 252—62.62 **5 Claims**

1. The method for preparing colloidal magnetic ferrite particles ranging in size from about 50A to about 800A as a dry powder, said powder when mixed with a hydrocarbon solvent producing a substantially stable colloidal dispersion comprising the steps of:

a. mixing a quantity of an aqueous colloidal dispersion of hydrothermally prepared magnetic ferrite particles ranging in size from 50A to about 800A with an excess amount of surfactant selected from the group consisting of non-drying fatty acids that are liquid and are not polymerized on exposure to air at ambient temperature, said surfactant when mixed with said aqueous colloidal dispersion being characterized by the property of forming an oily surfactant residue layer containing said colloidal magnetic ferrite particles and a supernatant clear aqueous layer,

b. agitating the resulting mixture whereby an oily surfactant residue layer containing said colloidal magnetic ferrite particles forms wherein said particles are coated with at least a monomolecular layer of surfactant and a supernatant clear aqueous layer forms, and recovering said oily surfactant residue layer,

c. mixing said recovered oily surfactant residue layer with hydrocarbon solvent whereby a colloidal dispersion forms, said hydrocarbon solvent having no significant deteriorating effect on the colloidal nature of said surfactant-coated ferrite particles,

d. mixing the resulting hydrocarbon solvent colloidal dispersion with a polar solvent in an amount which percipitates said colloidal ferrite particles, said polar solvent being a liquid organic compound containing oxygen in the molecule and being miscible with said hydrocarbon solvent,

e. recovering the resulting ferrite precipitate, and

f. drying said ferrite precipitate producing a dried precipitate, said dried precipitate being a powdery mass which when mixed with said hydrocarbon solvent forms a substantially stable colloidal dispersion.

3,928,221
SNOW AND ICE CONTROL COMPOSITIONS

Jack D. Slater; William G. H. Latham, and Robert H. Farrow, all of Savannah, Ga., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 15, 1973, Ser. No. 388,482

Int. Cl.² C09K *3/18*

U.S. Cl. 252—70 **10 Claims**

1. An aqueous snow and ice control composition containing as active ingredient a mixture of about 23 to about 25% by weight urea, about 11 to about 15% by weight ethylene glycol, about 35 to about 40% by weight methanol, balance water, with a sufficient quantity of alkali to adjust the pH of the composition from about 8.1 to about 8.4, characterized by a salting out temperature range of about −30°C to about −40°C.

3,928,222

SUPPRESSANT FOR COAL DUST

Walter A. Cheslick, Sr., 103½ Hickory Ave., Moundsville, W. Va. 26041

Filed Nov. 10, 1972, Ser. No. 305,231

Int. Cl.[2] C09K *3/22*

U.S. Cl. 252—88 1 Claim

1. A suppressant for coal dust consisting of an aqueous solution of magnesium sulfate and completely flourinated carboxylic acid.

3,928,223

BLEACHING AND DETERGENT COMPOSITIONS HAVING IMIDE ACTIVATOR AND PEROXYGEN BLEACH

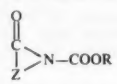
Leo Thomas Murray, East Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 134,451, April 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 677,747, Oct. 24, 1967, abandoned. This application Dec. 11, 1972, Ser. No. 314,100

Int. Cl.[2] C11D *3/395*

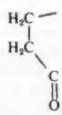
U.S. Cl. 252—95 10 Claims

1. A bleaching composition consisting essentially of a water soluble peroxygen bleaching compound selected from the group consisting of perborates, percarbonates, persulfates, persilicates, perphosphates, hydrogen peroxide and sodium peroxide; and a water soluble imide selected from the group consisting of imides having the formula

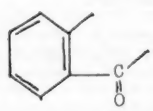


wherein R represents a C_1 to C_4 alkyl or phenyl, Z represents a substituent selected from the group consisting of

(a)



(b)



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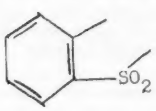
(c)



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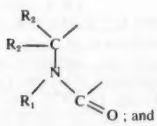
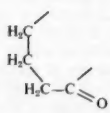
(d)



; and

(e)



wherein R_1 is hydrogen or —COOR and R_2 is hydrogen or methyl; the mol ratio of imide to peroxygen compound ranging from 0.01 to 2.0.

3,928,224

SHAMPOO COMPOSITION OBTAINED FROM THE POLYCONDENSATION OF GLYCIDOL ON ALPHA DIOLS WITH FATTY CHAIN WITH ALKALINE CATALYSTS

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Continuation-in-part of Ser. No. 142,409, May 11, 1971, Pat. No. 3,821,372. This application Aug. 1, 1973, Ser. No. 384,635

Claims priority, application Luxemburg, May 12, 1970, 60900

Int. Cl.[2] C11D *7/50*

U.S. Cl. 252—172 4 Claims

1. A shampoo composition for the hair, comprising at least one compound of the formula

$$R\text{-}CHOH\text{-}CH_2O\{CH_2\text{-}CHOH\text{-}CH_2\text{-}O\}_nH$$

wherein R is selected from the group consisting of aliphatic, cycloaliphatic or arylaliphatic radicals and mixtures thereof, having 7 to 21 carbon atoms, wherein the aliphatic moiety of said radicals is saturated or unsaturated, linear or branched, and optionally containing 1 to 6 ether, thioether and hydroxymethylene groups, n is greater than 1 and equal to or less than 10 and designates the average degree of polymerization, present in a proportion of 0.1 to 80 percent by weight of said composition.

3,928,225

GLASS FORMING MIXTURE WITH BORON AS THE DOPING MATERIAL FOR PRODUCING CONDUCTIVITY ZONES IN SEMICONDUCTOR BODIES BY MEANS OF DIFFUSION

Horst Schäfer, Wendelstein, Germany, assignor to SEMIKRON Gesellschaft fur Gleichrichterbau und Electronik m.b.H., Nurnburg, Germany

Filed Apr. 4, 1972, Ser. No. 241,070

Claims priority, application Germany, Apr. 8, 1971, 2117179

Int. Cl.[2] H01L *7/44*

U.S. Cl. 252—182 16 Claims

1. A glass-forming composition for doping a silicon semiconductor body with boron to produce conductivity zones in the semiconductor body by diffusion, said composition consisting essentially of boron trioxide as a boron doping compound in an amount effective to provide a conductivity zone, a polymerizable organic compound of a silicon semiconductor which provides an oxide of said semiconductor upon heating, said polymerizable organic compound being a silicic acid ester, and a metal salt of an organic acid which modifies the thermal expansion properties of the glass without adversely affecting the properties of the semiconductor body, the proportion of said metal salt to said boron trioxide providing a glass having a coefficient of thermal expansion of said semiconductor body, the metal of said metal salt being selected from the group consisting of nickel, lead, calcium and tin, and said composition being dissolved in a solvent which has a low vapor pressure and is capable of wetting said semiconductor body.

9. In a method of doping a semiconductor body with boron to produce conductivity zones in the semiconductor body by diffusion by applying to the semiconductor body a glass-forming composition which consists essentially of boron trioxide as a boron doping compound in an amount effective to provide a conductivity zone, a polymerizable organic compound of a silicon semiconductor which provides an oxide of said silicon semiconductor upon heating, said polymerizable organic compound being a silicic acid ester, and a solvent for said boron trioxide and said polymerizable organic compound, said sol-

vent having a low vapor pressure and being capable of wetting said semiconductor body, the improvement comprising: providing in said glass-forming composition a metal salt of an organic acid which modifies the thermal expansion properties of the glass without adversely affecting the properties of the semiconductor body, the proportion of said metal salt to said boron trioxide providing a glass having a coefficient of thermal expansion of said semiconductor body, and the metal of said metal salt being selected from the group consisting of nickel, lead, calcium and tin.

3,928,226
MULTI-DETECTABLE INK COMPOSITIONS AND METHOD OF USE

William F. McDonough, Trumbull; James A. Montlick, Darien, and Richard A. Bernard, Norwalk, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 16, 1974, Ser. No. 433,806
Int. Cl.² C09D *5/22*
U.S. Cl. 252—301.2 R **4 Claims**

1. A machine-readable marking ink composition having two or more mixed pigments for processing and distinguishing articles both visually and under radiation of a discrete predetermined wavelength, comprising

A. from 0.5 to 10 percent non-fluorescent pigment by weight;

B. from 2.0 to 25.0 percent fluorescent pigment by weight which fluoresces under radiation at a predetermined wavelength,

1. said fluorescent pigment being taken from the group consisting of

a. fluorescent pigment dispersions in a vehicle which comprises a resin dissolved in a narrow fraction petroleum distillate having a boiling range of from about 440°F. to 510°F.,

b. fluorescent pigment dispersions in a drying type alkyd resin, or

c. comminated solid solutions of fluorescent dyes in modified sulfonamide resins;

C. from 0.25 to 1.5 percent surfactant by weight;

D. from 0.25 to 5 percent gellant by weight; and

E. all of said pigments, said surfactant and said gellant being in a vehicle for the mixed pigment system,

1. said vehicle consisting essentially of a mixture of

a. dioctyl phthalate and

b. an aliphatic hydrocarbon having a distillation range of about 310°C. to 345°C.,

whereby the color of the ink under mixed light is different than the fluorescent color of the ink when irradiated at the fluorescent wavelength of said fluorescent pigment.

3,928,227
LIQUID SCINTILLATION, COUNTING AND COMPOSITIONS

Edwin A. Sena, Lafayette; Bert M. Tolbert, Boulder, both of Colo., and Chester L. Sutula, Granger, Ind., assignors to Sentol Associates, Granger, Ind.

Continuation-in-part of Ser. Nos. 613,109, Feb. 1, 1967, abandoned, and Ser. No. 29,267, April 16, 1970, abandoned.
This application Feb. 20, 1973, Ser. No. 334,068
Int. Cl. F21k *2/02*
U.S. Cl. 252—301.2 SC **10 Claims**

1. In a process of counting in liquid scintillation counting devices using liquid scintillation counting medium containing surfactant; the step comprising forming the medium by admixing

an amount of at least one of scintillation solvent and scintillation solute sufficient to absorb emissions from isotopes and radiate the absorbed energy at device-detectable levels

with

an amount of a plurality of different surfactants sufficient to impart thermodynamic stability to the resulting medium on addition of sample and during which counting reacts to provide essentially no fluorescence, chemiluminescence or phosphorescence, the plurality of surfactants being selected from the group consisting of

a. a combination of preferentially oil-soluble surfactant and preferentially water-soluble surfactant;

b. a combination of anionic surfactant and nonionic surfactant;

c. a combination of cationic and nonionic surfactant; and

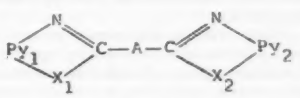
d. a combination of surfactant which acts as a dispersant and surfactant which acts as a surface-tension reducing agent.

3,928,228
4,4′-STILBENEBIS-PYRIDOOXAZOLES AND RELATED OPTICAL BRIGHTENERS AND POLYMERIC COMPOSITIONS BRIGHTENED THEREBY

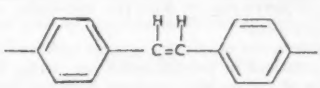
Nathan N. Crounse, Cincinnati, Ohio, assignor to Sterling Drug Inc., New York, N.Y.

Filed Apr. 28, 1969, Ser. No. 820,005
Int. Cl.² D06L *3/12*
U.S. Cl. 252—301.2 W **3 Claims**

1. A normally solid, fiber and film-forming polymeric material having incorporated therein about 0.005 to about 0.5 percent by weight of said polymeric material of a fluorescent compound of the formula



wherein Py_1 and Py_2 are each a bivalent heterocyclic nucleus of the pyridine class in which the open bonds are on vicinal ring carbon atoms of said nucleus wherein each of the pyrido rings is otherwise unsubstituted or further substituted by a member of the class consisting of halogen, lower alkoxy and lower alkyl; X_1 and X_2 are each a member of the class consisting of O, S and NR, wherein R is H, lower alkyl, hydroxy-lower alkyl, hydroxyoxaalkyl of 3 to 15 carbon atoms, phenyl-lower alkyl, cyano-lower alkyl, carboxy-lower alkyl, carbo-lower alkoxy-lower alkyl, phenyl-hydroxy-lower alkyl or lower alkenyl; and A is a bivalent 4,4′-stilbene radical of the formula



3,928,229
TRANSPARENT GLASS-CERAMIC LASERABLE ARTICLES CONTAINING NEODYMIUM

Norbert Neuroth, Mainz-Mombach, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Continuation of Ser. No. 86,010, Nov. 2, 1970, abandoned.
This application May 8, 1973, Ser. No. 358,224
Claims priority, application Germany, Nov. 3, 1969, 1955174
Int. Cl.² C09K *11/08*; **C03C** *3/22*, *3/04*; **C09K** *11/10*
U.S. Cl. 252—301.6 P **10 Claims**

1. A laserable article consisting of transparent glass ceramic as host material containing activating ions rendering the article capable of induced emission, the activating ions being neodymium ions in amount of 0.1–10 wt.-% calculated on the oxide.

3,928,230

ENCAPSULATION OF FLUIDS AND SOLIDS

William Unsworth, Manchester, and Graham Harry Helsby, Egerton, both of England, assignors to Magnesium Elektron Limited, Manchester, England

Continuation-in-part of Ser. No. 170,658, Aug. 10, 1971, abandoned. This application May 22, 1973, Ser. No. 362,794

Claims priority, application United Kingdom, Aug. 13, 1970, 39075/70

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **26 Claims**

1. A process for the encapsulation of fluids and solids comprising:

dissolving a water insoluble polymerisable epoxy monomer in a solvent having a higher affinity for water than for the monomer;

dispersing the monomer solution in water;

dispersing in the aqueous dispersion the substance to be encapsulated;

mixing into the resulting disperson a solution of a polymerising agent effective to polymerise said epoxy monomer in the presence of water, said polymerising agent being in a solvent having a higher affinity for water than the polymerising agent; and

continuing the mixing until polymerisation of the monomer is substantially complete.

11. A process for the encapsulation of fluids and solids comprising:

dispersing in water the substance to be encapsulated;

dissolving a water insoluble polymerisable epoxy monomer in a solvent having a higher affinity for water than the monomer;

dispersing the monomer solution in the aqueous dispersion of the substance;

mixing with the resulting dispersion of monomer and substance a solution of a polymerising agent effective to polymerise said epoxy monomer in the presence of water, said polymerising agent being in a solvent having a higher affinity for water than for the polymerising agent; and

continuing the mixing until polymerisation of the monomer is complete.

3,928,231

SELECTIVE HYDROCARBOXYLATION OF UNSATURATED FATTY COMPOUNDS

Edwin N. Frankel, Peoria, Ill., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 295,747, Oct. 6, 1972, abandoned. This application Nov. 15, 1973, Ser. No. 416,122

Int. Cl.[2] B01J *27/32, 31/40;* **C11C** *3/00;* **C07C** *55/00*

U.S. Cl. 252—413 **1 Claim**

1. A process for reactivating a spent hydrocarboxylation catalyst contained in the distillation pot residue from the distillation of carboxylated products from the reaction of unsaturated fatty compounds from the group consisting of mono- and polyunsaturated fatty acids, fatty acid alkyl esters, and triglyceride vegetable oils with carbon monoxide at pressures of from about 3000 to 4500 p.s.i.g. and a 10 to 100 mole percent excess of a stoichiometric amount of water in the presence of a catalytic amount of palladium chloride admixed with a trisubstituted phosphine from the group consisting of triphenylphosphine and trialkylphosphines in molar ratios of from 1:2 to 1:4 palladium chloride:trisubstituted phosphine, at temperatures of from about 100° to 160° C. for a period of time sufficient to produce carboxylated products in conversion yield of from 86 to 99 percent, said carboxylated products being distilled at temperatures of from about 135° to 220° C. and at pressures of from 0.02 to 0.01 mm. of mercury in such a manner that from 93 to 95 percent by weight of said reaction products are removed and the carboxylated products being characterized as having substantially all of the added carboxyl groups attached to one of the originally unsaturated carbon atoms in said unsaturated fatty compounds; comprising the steps of:

a. oxidizing the distillation pot residue with concentrated nitric acid;

b. mixing the oxidized distillation pot residue with water at 0° C.;

c. extracting the mixture resulting from step (b) with diethyl ether;

d. neutralizing the diethyl ether solution resulting from step (c);

e. drying the neutralized diethyl ether solution resulting from step (d);

f. removing the diethyl ether from the dried, neutralized diethyl ether solution resulting from step (e); and

g. admixing the oxidized distillation pot residue product of step (f) with said trisubstituted phosphine and hydrogen chloride in weight ratios of from 1:0.2:0.02 to 1:3:0.06 oxidized residue product:trisubstituted phosphine:hydrogen chloride.

3,928,232

ARYL SULFONATE STABILIZED COBALT CARBONYL COMPLEX COMPOUNDS

John B. Wilkes, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 300,053, Oct. 24, 1972, abandoned, which is a division of Ser. No. 32,386, April 27, 1970, abandoned. This application Mar. 1, 1974, Ser. No. 447,173

Int. Cl.[2] B01J *27/20*

U.S. Cl. 252—428 **5 Claims**

1. The method of inhibiting the formation of a cobalt metal plate on the surface of a system containing a cobalt carbonyl complex compound in a substantially water-free organic liquid medium and in the presence of carbon monoxide, said inhibition being in connection with the surface in contact with the organic liquid medium, which comprises adding an alkyl aryl sulfonate solute to the organic liquid medium, and wherein said alkyl aryl sulfonate is of the formula R_nYSO_3M, wherein Y is an aryl carbocyclic nucleus having a carbon atom content in the range from 6 to about 13, wherein R is an alkyl hydrocarbon group having a carbon atom content in the range from about 3 to 30, wherein M is selected from the group consisting of alkali metal, calcium and ammonium cations, said ammonium ions being of the formula $R_4'N^{(+)}$ wherein the groups R′ are the same or different and may be hydrogen or alkyl hydrocarbon radicals having a carbon atom content in the range from about 1 to 20, and wherein *n* is an integer in the range from 1 to 4, inclusive, and where *n* is greater than 1, said R may be the same or different groups, and wherein for each mol of cobalt carbonyl complex in the organic liquid medium there is present 0.001 to 2 mols of alkyl aryl sulfonate.

3,928,233

HYDROGENATIVE CONVERSION CATALYSTS

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 281,116, Aug. 16, 1972, which is a division of Ser. No. 869,389, Oct. 24, 1969, abandoned, which is a continuation-in-part of Ser. No. 669,288, Sept. 20, 1967, abandoned. This application Nov. 2, 1972, Ser. No. 302,998The portion of the term of this patent subsequent to July 13, 1988, has been disclaimed.

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B01J *11/40*

U.S. Cl. 252—455 Z **5 Claims**

1. The catalytic composition containing a crystalline aluminosilicate zeolite, a Group VI metal component selected from the group consisting of tungsten and molybdenum metals, oxides and sulfides, and a stabilizing amount of a stabilizing component comprising a Group IV metal selected from the group consisting of titanium and zirconium.

3,928,234

CATALYST FOR THE REDUCTION OF AUTOMOBILE EXHAUST GASES

James A. Ford, North Haven, Conn., and Sheldon H. Butt, Godfrey, Ill., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 385,077, Aug. 2, 1973, Pat. No. 3,876,456, which is a continuation-in-part of Ser. No. 342,271, March 16, 1973, Pat. No. 3,810,754. This application Aug. 28, 1974, Ser. No. 501,249. The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.[2] B01J *29/14*

U.S. Cl. 252—455 R 6 Claims

1. A catalyst for the reduction of automobile exhaust pollution comprising:

A. a nickel alloy substrate containing from 2 to 6% aluminum, from 0.5 to 4% silicon, from 0.001 to 6% chromium, balance essentially nickel; and

B. a surface layer of material on said substrate, having a composition at the surface of from 0.01 to 8% aluminum, from 0.01 to 6% silicon, from 0.001 to 6% chromium, from 10 to 50% copper, said surface layer having a thickness of from 1000 A to 0.1 inch, with the copper concentration varying from 10 to 50% at the surface to essentially 0% within the substrate, balance essentially nickel, the combined substrate and surface layer having been heat-treated at 750° to 1,050°C. for a time of 5 minutes to 4 hours in an atmosphere non-oxidizing to nickel.

3,928,235

CATALYST FOR PURIFICATION OF WASTE STREAMS

Paul Douglas Goodell, Ridgewood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 411,692

Int. Cl. B01j *11/06 11/22*

U.S. Cl. 252—458 29 Claims

1. As a catalyst material, an alloy in the form of a powder of uniform composition consisting essentially of (A) chromium and copper or (B) chromium, nickel and copper, said alloy powder being or capable of being on heat treatment substantially free of optically observable heterogeneities of a size greater than about 20 microns, said composition (A) consisting essentially of about 15 to about 45 percent chromium and the balance essentially copper, and said composition (B) consisting essentially of about 5 to about 50 percent chromium, about 5 to about 60 percent nickel, and the balance essentially copper, said chromium, nickel and copper components being correlated as defined by the area falling within the boundary A-B-C-D-E-A of FIG. 1.

3,928,236

ALUMINA CATALYST CARRIERS AND THE PROCESS FOR PRODUCING THEM

Ronald J. Rigge, Pleasanton, and Stephen C. Carniglia, Byron, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 25, 1974, Ser. No. 527,093

Int. Cl.[2] B01J *21/04*

U.S. Cl. 252—463 11 Claims

1. A process for producing shaped high purity, thermally stable active alumina catalyst carriers which comprises:

a. treating alumina shapes, having a crystalline phase structure selected from the group consisting essentially of chi-rho-eta, pseudoboehmite and mixtures thereof, in an aqueous medium with an ammonium salt having a pH in aqueous solution within the range of 4–9,

b. subjecting the treated shapes to a pressure treatment at a temperature within the range of about 100°C and about 250°C for a time period of about 4 to about 36 hours,

c. leaching the pressure-treated shapes with water at a temperature from about 20°C to about 100°C,

d. drying the leached shapes and then subjecting the dried shapes to a thermal activation step within the temperature range from about 500°C to about 980°C for a time period from about 30 minutes to about 100 minutes.

3,928,237

METHOD OF CATALYST PREPARATION FOR USE IN SUPPRESSING HYDROCARBON AND CARBON MONOXIDE EMISSION FROM INTERNAL COMBUSTION ENGINES

Robert E. Davis, 125 Hillcrest, Hinsdale, Ill. 60521

Continuation-in-part of Ser. No. 307,652, Nov. 17, 1972, abandoned. This application Aug. 20, 1973, Ser. No. 389,963

Int. Cl.[2] B01J *23/16*

U.S. Cl. 252—463 15 Claims

1. A method of preparing a catalyst on a substrate for use in suppressing hydrocarbon and carbon monoxide emission from internal combustion engines comprising taking a solution containing dissolved platinum, complexing the platinum by adding ammonia to the solution, contacting an amount of substrate with the solution so that the substrate absorbs the solution, and heating the substrate to remove ammonia and water to provide a catalyst, the amount of substrate added to the solution being such that the weight of platinum in the solution is about 0.1% of the weight of the catalyst.

13. A catalyst for reducing hydrocarbon and carbon monoxide emission from internal combustion engines comprising a plurality of pellets, some of the pellets containing platinum but not palladium and some of the pellets containing palladium but not platinum, the platinum-containing pellets and the palladium-containing pellets being mixed together.

3,928,238

EXHAUST GAS PURIFYING CATALYST AND PROCESS OF MAKING AND USING SAME

Edgar Koberstein, Alzanau, and Eduard Lakatos, Grossenhausen, both of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed Oct. 12, 1973, Ser. No. 406,075

Claims priority, application Germany, Oct. 13, 1972, 2250200

Int. Cl.[2] B01J *23/16*

U.S. Cl. 252—465 25 Claims

1. A process for preparing an oxidic, carrier catalyst, said catalyst comprising at least one heavy metal compound as active component, said process comprising providing a temperature resistant carrier material with a catalytically active coating without substantial mutual permeation of said coating and carrier material by:

A. intensively mixing said carrier with a binding agent until the surface of said carrier is slightly glutinous;

B. applying to said carrier from step (A) at least one pulverulent, oxidic, heavy metal compound, a pulverulent mass containing at least one of said oxidic heavy metal compounds or at least one hydroxyl group-containing precursor of said heavy metal compounds, wherein said heavy metal is selected from the group consisting of copper, chromium, nickel, titanium, vanadium, manganese, iron, cobalt, zinc, tin, molybdenum, tungsten and bismuth; and

C. heating the resulting mass from step (B) to remove said binding agent.

3,928,239

METHOD FOR THE PRODUCTION OF EXHAUST AND WASTE GASES PURIFYING CATALYSTS

Kiyoshi Yonehara, Suita; Kunihiro Kubota, Takatsuki; Tetsuji Ono, Amagasaki, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Filed Nov. 29, 1973, Ser. No. 419,943

Claims priority, application Japan, Nov. 30, 1972, 47-11939; Nov. 30, 1972, 47-119397

Int. Cl.² B01J *23/08*

U.S. Cl. 252—466 PT 14 Claims

1. A method for the production of a catalyst for purification of exhaust gases of internal combustion engines and waste gases of industrial plants comprising the steps of: dissolving an alumina sol with an inorganic aicd to form an alumina sol solution, adding to the solution a finely powdered alumina containing at least 50% by weight of rho-alumina and capable of forming activated alumina on calcination to form an alumina slurry, immersing in the alumina slurry a monolithic multicellular chemically inert refractory support, while maintaining said slurry at a temperature of 0° to 30°C, to deposit a coating film of alumina on to the surface of said support, aging the immersed support at a temperature not exceeding 50°C for at least 30 minutes, drying said coating film of alumina to form a thin uniform film of alumina on the surface of said support, impregnating the so treated support in a solution or suspension containing a member selected from the group consisting of water soluble salts, metallic acids and metallic colloids of a noble metal to deposit a noble metal thereon and subjecting the noble metal-supporting support to activation at a temperature of 150° to 600°C.

3,928,240

PROCESS FOR THE PREPARATION OF MOLYBDENUM-CONTAINING OXIDATION CATALYSTS

Ernest C. Milberger, Solon, and Serge R. Dolhyj, Parma, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 177,105, Sept. 1, 1971. This application Aug. 27, 1973, Ser. No. 391,775

Int. Cl.² B01J *23/16, 23/18, 23/24*

U.S. Cl. 252—467 9 Claims

1. In the process for the preparation of oxidation catalysts containing antimony, molybdenum and oxygen or vanadium, molybdenum and oxygen or tungsten, molybdenum and oxygen, using an aqueous solution or slurry of a compound containing hexavalent molybdenum, the improvement comprising partially reducing in the aqueous solution or slurry the molybdenum in the compound containing hexavalent molybdenum to a valence state below +6 with a reducing agent capable of reducing hexavalent molybdenum.

3,928,241

CATALYSTS FOR PURIFYING EXHAUST GAS

Itaru Niimi, Nagoya; Yasuhisa Kaneko, Toyota; Akiyoshi Morita, Toyota; Yasuo Nemoto, Toyota, and Mitsuyoshi Sato, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Feb. 12, 1973, Ser. No. 331,888

Claims priority, application Japan, Feb. 12, 1972, 47-14983

Int. Cl.² B01J *23/86, 23/72*

U.S. Cl. 252—470 3 Claims

1. An exhaust gas purifying catalyst comprising an alloy consisting essentially of 0.1–40% Cu and the balance of at least one of the group consisting of Ni, Fe, and a combination of Ni and Fe by weight as fundamental components, and including a surface formed by first oxidizing the alloy by heating at 700°C. – 1100°C. in an oxidizing atmosphere for ½ to 24 hours to provide an oxidized layer at least 10μ in thickness, and thereafter reducing the oxidized layer in a reducing atmosphere at approximately 800°C. for about 2 hours.

3,928,242

METAL OXIDE VARISTOR WITH DISCRETE BODIES OF METALLIC MATERIAL THEREIN AND METHOD FOR THE MANUFACTURE THEREOF

John E. May, Skaneateles, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 19, 1973, Ser. No. 417,274

Int. Cl.² H01B *1/02*

U.S. Cl. 252—513 13 Claims

6. A metal oxide varistor having a sintered body comprising zinc oxide powder and a small percentage of at least one additive selected from the group consisting of metal oxides and metal fluorides, said zinc oxide and at least one additive forming a varistor phase and wherein said body portion further comprises discrete bodies of metallic matter distributed therethrough and wherein said discrete bodies of metallic matter are separated by said varistor phase.

3,928,243

THICK FILM RESISTOR PASTE CONTAINING TANTALA GLASS

Thomas M. Kudza, Swartz Creek; Raymond E. Schwyn, Flint, and Morris Berg, Grand Blanc, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 3, 1974, Ser. No. 485,337

Int. Cl.² H01B *1/02*

U.S. Cl. 252—514 9 Claims

1. A resistor composition suitable for electrical resistors comprising a mixture in relatively small amounts of ruthenia, antimony or bismuth trioxide and tantalum pentoxide, together with relatively large amounts of silver, non-conducting lead-borosilicate glass and conducting tantala glass.

3,928,244

ELECTRICALLY CONDUCTIVE REFRACTORY BODY

Edmund M. Passmore, Wilmington, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Nov. 1, 1973, Ser. No. 412,008

Int. Cl.² H01B *1/00*

U.S. Cl. 252—520 1 Claim

1. An electrically conductive refractory boat, for the vacuum deposition of metals, consisting essentially of TiB_2, BN and TiH_2, wherein said boat has the following composition: 5 to 65 volume percent of BN; 20 to 50 volume percent of TiB_2; 1 to 5 volume percent of TiH_2; 0 to 30 volume percent of AlN.

3,928,245

METAL OXIDE VOLTAGE-VARIABLE RESISTOR COMPOSITION

Herbert Fishman, and James S. Kresge, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed July 9, 1973, Ser. No. 377,218

Int. Cl.² H01B *1/08*

U.S. Cl. 252—521 5 Claims

1. A voltage-variable sintered body resistor composition of the type consisting mostly of zinc oxide and comprising a significant amount of silicon dioxide, wherein the improvement comprises that said composition also contains significant amounts of at least one of the impurities chosen from the group consisting of barium oxide and boron oxide.

4. The composition defined in claim 1 and comprising additionally at least one impurity chosen from the group consisting of bismuth trioxide, cobaltic trioxide, manganese dioxide, antimony oxide, and chromic oxide.

3,928,246

PERFUME COMPOSITION INCLUDING OXYGENATED DECALIN DERIVATIVES

Paul A. Stadler, Biel-Benken, Basel-Land; Albert Eschenmoser, Kusnacht, Zurich, and Erling Sundt, Pinchat-Geneva, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Continuation of Ser. No. 780,162, Nov. 29, 1968, abandoned. This application Feb. 2, 1973, Ser. No. 329,073

Claims priority, application Switzerland, Nov. 29, 1967, 16745/67; Nov. 22, 1968, 17405/68

Int. Cl. A61k 7/00; C11b 9/00

U.S. Cl. 252—522 1 Claim

1. A perfume composition comprising a mixture of perfuming ingredients including an odour-modifying amount of at least one odoriferous compound selected from the group consisting of cis-1,7,7 -trimethylbicyclo [4.4.0] decan-3-one, trans-1,7,7,-trimethylbicyclo [4.4.0] decan-3-one, and 1,7,7-trimethyl-3-acetoxybicyclo [4.4.0] decane.

3,928,247

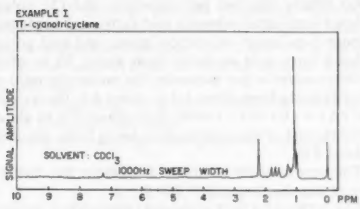
NOVEL PERFUMERY USES OF π-CYANOTRICYCLENE

Braja Dulal Mookherjee, Matawan; Venkatesh Kamath, Red Bank, both of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

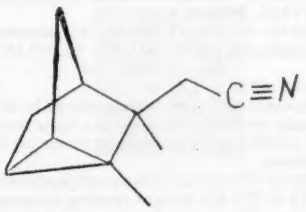
Filed Mar. 10, 1975, Ser. No. 556,874

Int. Cl.² A61K 7/46; C11B 9/00

U.S. Cl. 252—522 4 Claims



1. A perfume composition comprising π-cyanotricyclene having the structure:



and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, esters and lactones.

3,928,248

FRAGRANCE MATERIALS CONTAINING 4-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-2-BUTANOL AND/OR 4-(6,6-DIMETHYL-2-METHYLENE-3-CYCLO-HEXEN-1-YL)-2-BUTANOL, AND/OR ACETALS THEREOF, AND METHODS FOR PRODUCING SAME

Braja Dulal Mookherjee, Matawan; Manfred Hugo Vock, Locust, both of N.J.; Carlos Benaim, Hartsdale, and Edward J. Shuster, Brooklyn, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 461,704, April 17, 1974, Pat. No. 3,899,597. This application Mar. 24, 1975, Ser. No. 561,188

Int. Cl.² A61K 7/46; C11B 9/00

U.S. Cl. 252—522 12 Claims

2. A fragrance modifying composition containing an oxo compound selected from the group consisting of 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanol, 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanol, 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butyl acetate and 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butyl acetate and an auxiliary perfume ingredient.

3,928,249

LIQUID DETERGENT COMPOSITION

Gennaro Nunziata; Rainer Walter Max Schone, and Gianfranco Spadini, all of Brussels, Belgium, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 29, 1973, Ser. No. 327,545

Claims priority, application Luxemburg, Feb. 7, 1972, 64,743

Int. Cl.² C11D 3/04, 1/75

U.S. Cl. 252—526 21 Claims

1. A liquid, clear, homogeneous, easily dispensable, stable, concentrated, aqueous, detergent composition containing hydrosoluble surface-active detergents and usual minor additives, characterized in, that it contains, calculated on the total weight of the composition:

(A) from about 5 to about 15% by weight of a polyethylene glycol ether sulfate of the general formula

$$R_1O(C_2H_4O)_nSO_3M \quad (I)$$

wherein R_1 is a straight or branched, saturated or unsaturated hydrocarbon radical having 8 to 20 carbon atoms; *n* is from 1.5 to 12; M is an alkali-metal, ammonium, and dimethyl-, diethyl-, trimethyl-, triethyl-, dimethanol-, trimethanol-, diethanol- and triethanol ammonium salt;

(B) from about 8 to about 20% by weight of an aliphatic hydrocarbon sulfonate of the general formula

$$R_2SO_3M \quad (II)$$

wherein R_2 is a straight or branched, saturated or unsaturated hydrocarbon radical having 8 to 20 carbon atoms; M has the meaning given above;

C. from about 3 to about 12% by weight of nonionic surface-active detergent of which at least 20% and up to 100% by weight consists of a tertiary amine oxide of the formula

$$R_3R_4R_5N \rightarrow O \quad (III)$$

wherein R_3 is a branched or straight, saturated or unsaturated hydrocarbon radical having 8 to 20 carbon atoms; R_4 and R_5 represent each a methyl-, ethyl-, hydroxymethyl- and hydroxyethyl radical; while the other 0 to 80% by weight of nonionic surface-active detergent is selected from the group consisting of polyethylene glycol condensation product having a molecular weight from about 160 to 800; a condensation product of 3 to 15 moles of ethylene oxide per mole of aliphatic or alkyl aromatic compound having 8 to 20 carbon atoms and at least one reactive hydrogen atom; a saccharide fatty acid ester, and a polyoxyethylene saccharide fatty acid ester;

D. from about 2 to about 15% by weight of a solubilizing agent selected from the group consisting of C_{1-4} alcohol; potassium, sodium and ammonium salt of C_{1-3} alkyl and di-C_{1-2} alkyl-phenyl sulfonic acid; and urea;

E. from about 5 to about 9% by weight of an organic acid selected from the group consisting of acetic-, citric-, gluconic-, glycolic-, lactic-, malic, maleic-, o-phthalic-, and p-phthalic acid;

whereby the weight ratio of (A) to (B) varies between 1 to 3 and 1 to 1, and the weight ratio of (C) to (A) + (B) varies between 1 to 5 and 1 to 2.

7. A liquid detergent composition according to claim **1**, characterized in, that it contains 2 to 3% by weight of —Na or —K salt of meta-, ortho- or pyroboric acid.

3,928,250
WASHING COMPOSITION CONTAINING SUDS SUPPRESSING AGENTS

Kurt Kosswig, and Herbert Meister, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

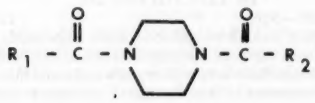
Filed Sept. 28, 1973, Ser. No. 401,691

Claims priority, application Germany, Oct. 5, 1972, 2248842

Int. Cl.² C11D *1/58, 3/28*

U.S. Cl. 252—542 **8 Claims**

1. A low-sudsing washing composition comprising detergent compounds and additives, and 1–40% by weight, based on the weight of the active detergent compounds of the washing composition, of a suds-suppressing agent, said agent being a piperazine derivative of the formula:



wherein R_1 and R_2 each are alkyl groups of 9–21 carbon atoms.

3,928,251
MILD SHAMPOO COMPOSITIONS

Raymond Edward Bolich, Jr., Montgomery, and Robert Benson Aylor, Blue Ash, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 11, 1972, Ser. No. 313,908

Int. Cl.² C11D *1/92*

U.S. Cl. 252—545 **16 Claims**

1. A mild shampoo composition comprising surfactants and water, said surfactants consisting of a mixture of:

A. a polyethoxylated anionic surfactant selected from the group consisting of (1) a surfactant having the formula $R(OC_2H_4)_nOSO_3M$, wherein R is a hydrophobic group selected from the group consisting of alkyl groups containing from about 8 to about 16 carbon aroms, alkylphenyl groups wherein the alkyl group contains from about 6 to about 15 carbon atoms, and fatty acid amido groups wherein the fatty acid contains from about 8 to about 16 carbon atoms, wherein n is a number from about 1 to about 10 and M is a non-toxic cation which makes the surfactant water-soluble, and (2) a water-soluble polyethoxylated fatty alcohol sulfosuccinate monoester wherein said fatty alcohhol contains from about 8 to about 16 carbon atoms and said polyethoxylated fatty alcohol contains from about 1 to about 10 ethoxy moieties per molecule; (B) a zwitterionic surfactant having the formula $(R^2)_AN^{(+)}\ (R^3)_{3-A}CH_{2-B}(R^2)_B(R^4)_CY^{(-)}$, wherein A, B, and C are each selected from the group consisting of 0 and 1, wherein A is 0 when B is 1 and A is 1 when B is 0, wherein C can only be 1 when Y is a sulfonate group, wherein each R^2 is selected from the group consisting of alkyl groups containing from about 8 to about 16 carbon atoms, and a moiety having the formula R^5 —C(O)NH — R^6 - wherein R^5 is an alkyl group containing from about 8 to about 16 carbon atoms and R^6 is an alkylene group containing from 1 to about 5 carbon atoms, wherein each R^3 is selected from the group consisting of alkyl, hydroxyalkyl and alkoxyalkyl groups which can be connected to form a ring and each of which contains from 1 to about 3 carbon atoms, wherein Y is selected from the group consisting of sulfonate and carboxylate groups, and wherein R^4 is an alkylene group containing from 1 to about 5 carbon atoms when Y is a carboxylate group and R^4 is selected from the group consisting of alkylene and hydroxyalkylene groups containing from 2 to about 5 carbon atoms when Y is a sulfonate group, and wherein the hydroxy group in said hydroxyalkylene groups is on a secondary carbon atom; C. a polyethoxylated nonionic surfactant selected from the group consisting of: (1) polyethoxylated alkyl alcohols, said alkyl alcohols containing an alkyl group containing from about 8 to about 16 carbon atoms and said polyethoxylated alkyl alcohols containing from about 10 to about 45 ethoxy moieties per molecule, (2) polyethoxylated alkylphenols wherein the alkyl group contains from about 6 to about 15 carbon atoms and wherein the polyethoxylated alkylphenol contains from about 10 to about 45 ethoxy moieties per molecule, (3) polyethoxylated mono fatty acid esters of sorbitol wherein said fatty acids contain from about 8 to about 18 carbon atoms and said polyethoxylated mono fatty acid ester of sorbitol contains from about 10 to about 45 ethoxy moieties per molecule, (4) polyethoxylated polypropylene glycol, said polypropylene glycol having a molecular weight of from about 1000 to about 15,000 and said polyethoxylated polypropylene glycol containing from about 15 to about 300 ethoxy moieties per molecule, and (5) polyethoxylated fatty acids wherein said fatty acid contains from about 8 to about 16 carbon atoms and said polyethoxylated fatty acid contains from about 10 to about 45 ethoxy moieties per molecule, the molecular ratio of (A) to (B) being from about 1:1 to about 4:1; the weight ratio of (A) + (B) to (C) being from about 2:1 to about 1:2; and the pH of the composition being from about 6.0 to about 8.0.

9. The composition of claim **1** wherein the zwitterionic surfactant has the formula

$$R^{10}N^{(+)}(R^{11})_2CH_2CHX\ CH_2SO_3^{(-)}$$

wherein R^{10} contains from about 10 to about 16 carbon atoms, wherein each R^{11} is selected from the group consisting of methyl, ethyl, and 2-hydroxyethyl groups, and wherein X is selected from the group consisting of hydrogen and hydroxyl groups.

3,928,252
THICKENED FOOD

Lloyd E. Rigler, Los Angeles; Ghazi H. Taki, North Hollywood, and Nicholas G. Spirtos, Tarzana, all of Calif., assignors to Adolph's Ltd., Burbank, Calif.

Division of Ser. No. 206,912, Dec. 10, 1971, abandoned. This application July 9, 1973, Ser. No. 377,452

Int. Cl.² A23L *1/04*

U.S. Cl. 426—573 **17 Claims**

1. A thickened food preparation produced by the addition of an initially dry thickening agent to a liquid food preparation, said initially dry thickening agent comprising the following ingredients:

a. about 50 to 75% sodium carboxymethylcellulose;

b. about 15 to 25% of a halogen donating compound;

c. about 10 to 15% of a bicarbonate selected from the group consisting of sodium and potassium bicarbonate; and

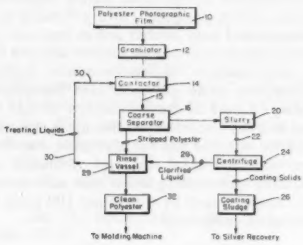
d. about 3 to 10% of an organic acid.

wherein said ingredients are added substantially at the same time to said liquid preparation.

3,928,253
PROCESS FOR RECOVERY OF CLEAN POLYESTER MATERIALS

J. Scott Thornton, Chagrin Falls, and Donald E. Glowe, Kent, both of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio

Filed May 10, 1972, Ser. No. 252,327
Int. Cl.² G03C *11/24*; B08B *3/08*
U.S. Cl. 260—2.3 **1 Claim**



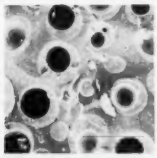
1. A process for the separate recovery of clean polyester and contaminants associated therewith from polyester photographic film scrap consisting of a polyester base, a subcoating on said base said subcoating consisting essentially of copolymers of vinyl chloride or vinylidene chloride with an acid selected from the group consisting of itaconic, acrylic and methacrylic and a silver containing gelatine coating on said subcoating which comprises:

1. contacting said polyester photographic film scrap with an aqueous solution of an alkaline organic liquid reagent which will detach the contaminants from the polyester film base material; said aqueous solution consisting essentially of monoethanolamine and 2% to 15% by weight of water and having a temperature between 100°C and 170°c, for a time sufficient to remove both the coating and the subcoating from said base;
2. physically separating the polyester material from the solution and contaminants; and
3. recovering the resulting clean polyester material.

3,928,254
UNIFORMLY PIGMENTED UNSATURATED POLYESTER RESIN MOLDED ARTICLES

Yuzi Takayama, Kamakura; Yutaka Ichimura, Tokyo; Takanobu Aoyagi, and Takahiro Kishino, both of Yokohama, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Aug. 3, 1973, Ser. No. 385,346
Claims priority, application Japan, Aug. 4, 1972, 47-77712
Int. Cl.² C08J *9/00*; C08L *67/00*
U.S. Cl. 260—2.5 B **10 Claims**



×200

1. A filler- and fiber-reinforced, uniformly pigmented, unsaturated polyester resin molded article having low profile, which comprises a structure in which unconnected hollow balls having a diameter of 5 to 300μ with a wall of a styrene polymer containing 0.1 to 6% by weight of carboxyl group, the wall having a thickness of 1 to 50μ, are dispersed in a cured α,β-ethylenically unsaturated polyester-styrene matrix; the amount of said styrene polymer being 5 to 30% by weight based on the weight of the total resin components and the unsaturated polyester-styrene copolymer consisting of 20 to 80% by weight of unsaturated polyester and 80 to 20% by weight of styrene; said styrene polymer having a refractive index less than 0.05 different from that of the copolymer, the total volume of voids of the hollow balls being 10 to 25% by volume based on the volume of the copolymer.

3,928,255
CHEMICALLY JOINED, PHASE SEPARATED SELF-CURED HYDROPHILIC THERMOPLASTIC GRAFT COPOLYMERS AND THEIR PREPARATION

Ralph Milkovich, Naperville, and Mutong T. Chiang, Palos Heights, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Continuation-in-part of Ser. Nos. 117,733, Feb. 22, 1971, abandoned, and Ser. No. 244,205, April 14, 1972, Pat. No. 3,832,423, and Ser. No. 282,099, Aug. 21, 1972, Pat. No. 3,786,116. This application Jan. 11, 1974, Ser. No. 432,788
Int. Cl.² C08L *31/02*
U.S. Cl. 260—2.5 R **18 Claims**

1. A hydrogel comprising a chemically joined, phase separated self-cured hydrophilic thermoplastic graft copolymer in the form of a hydrogel containing from about 10 to about 95% by weight of an aqueous liquid based on the weight of said graft copolymer, wherein said graft copolymer is composed of:

1. at least one copolymerizable normally hydrophobic macromolecular monomer having a substantially uniform molecular weight distribution, and

2. at least one hydrophilic (water-soluble) copolymerizable comonomer or compound rendered hydrophilic forming the polymeric backbone of said copolymer, said copolymerizable normally hydrophobic macromolecular monomer forming linear polymeric sidechains of said graft copolymer, wherein:

a. the polymeric backbones of the graft copolymer are comprised of polymerized units of said copolymerizable comonomers, said copolymerizable comonomers being at least one ethylenically unsaturated monomer of a hydrophilic or water-soluble compound and mixtures thereof or a compound which can be rendered hydrophilic or water soluble;

b. the linear polymeric sidechains of the graft copolymer consist essentially of a polymerized hydrophobic macromolecular monomer, said hydrophobic macromolecular monomer comprising a linear polymer or copolymer having a molecular weight of at least about 2,000 and having a substantially uniform molecular weight distribution, such that its ratio of Mw/Mn is not substantially above about 1.1, said macromolecular monomer being further characterized as having no more than one copolymerizable moiety per linear polymer or copolymer chain, said copolymerization occurring between the copolymerizable end group of said hydrophobic macromolecular monomer and said copolymerizable hydrophilic comonomer; and

c. the linear polymeric sidechains of the graft copolymer which are copolymerized into the copolymeric backbone are separated by at least about 20 uninterrupted recurring monomeric units of said hydrophilic polymeric backbone, the distribution of the sidechains along the backbone and the copolymerization being controlled by the reactivity ratios of the copolymerizable end group on said hydrophobic macromolecular monomer and said copolymerizable hydrophilic comonomer.

3,928,256
PROCESS FOR THE PREPARATION OF CARBODIIMIDE-ISOCYANURATE FOAMS

Moses Cenker, Trenton, and Thirumurti L. Narayan, Riverview, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Feb. 25, 1974, Ser. No. 445,054
Int. Cl.² C08G *18/20, 18/14, 18/02, 18/06*
U.S. Cl. 260—2.5 BF **10 Claims**

1. A process for the preparation of a cellular foam characterized by carbodiimide and isocyanurate linkages which comprises condensing an organic polyisocyanate in the presence of a catalytically sufficient amount of a catalyst system consisting essentially of a tertiary amine trimerization catalyst selected from the group consisting of 1,3,5-tris(N,N-dialkylaminoalkyl)-s-hexahydrotriazines and alkylene oxide and water adducts thereof and a β-hydroxyalkyl N-substituted tertiary amine having a molecular weight of from 89 to 304 and containing from 1 to 3 tertiary amino groups wherein each nitrogen atom is substituted by at least one β-hydroxyalkyl group wherein the alkyl group contains from 1 to 4 carbon atoms.

3,928,257
REDUCTION OF FRIABILITY IN RIGID POLYURETHANE FOAM

Stephen Fuzesi, and Allan H. Syrop, both of Hamden, Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 23, 1974, Ser. No. 508,589
Int. Cl.² C08G *18/14, 18/32, 18/50*
U.S. Cl. 260—2.5 AS **15 Claims**

1. In a process of preparing a rigid polyurethane foam from a reaction mixture comprised of a polyether polyol reactant, an organic polyisocyanate reactant, a reaction catalyst and a foaming agent, said polyether polyol reactant having a hydroxyl number of about 150–800 and being the product of condensing 4,4,4-trichloro-1,2-epoxybutane with a mixture selected from the group consisting of a mixture of dextrose and water, a mixture of dextrose and an aliphatic diol or triol, and a mixture of dextrose, water and an aliphatic diol or triol, the improvement of including in said reaction mixture a second polyether polyol having a hydroxyl number of about 200–500 which is an adduct of ethylene oxide and an aliphatic diol, an aliphatic triol or a mixture thereof, said second polyether polyol being employed in a proportion which is effective in reducing the friability of said foam.

3,928,258
PREPARATION OF LOW FRIABILITY RIGID POLYURETHANE FOAM

Roy P. Alexander, Killingworth, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 23, 1974, Ser. No. 508,544
Int. Cl.² C08G *18/14, 18/48, 18/50*
U.S. Cl. 260—2.5 AS **17 Claims**

1. In a process of preparing a rigid polyurethane foam from a reaction mixture comprised of a polyether polyol reactant, an organic polyisocyanate reactant, a reaction catalyst and a foaming agent, said polyether polyol reactant having a hydroxyl number of about 150–800 and being the product of condensing 4,4,4-trichloro-1,2-epoxybutane with a mixture selected from the group consisting of a mixture of dextrose and water, a mixture of dextrose and an aliphatic diol or triol, and a mixture of dextrose, water an an aliphatic diol or triol, the improvement of including in said reaction mixture a second polyether polyol having 2–3 hydroxy groups and a molecular weight from about 1,000 to about 6,000, said second polyether polyol being employed in a proportion which is effective in reducing the friability of said foam.

3,928,259
HALOGENATED BUTYL RUBBER OF IMPROVED SCORCH CHARACTERISTICS

George Feniak, Wyoming, Canada, assignor to Polysar Limited, Sarnia, Canada

Division of Ser. No. 408,542, Oct. 23, 1973, Pat. No. 3,880,821. This application Nov. 22, 1974, Ser. No. 526,252
Claims priority, application Canada, Nov. 24, 1972, 157388
Int. Cl.² C08D *9/04;* **C08C** *11/34*
U.S. Cl. 260—5 **10 Claims**

1. A vulcanizable composition having improved scorch characteristics which comprise (a) a polymeric component being a halogenated butyl rubber and at least one of natural rubber and synthetic unsaturated rubbers selected from polyisoprene, polybutadiene, styrene-butadiene polymers and ethylene-propylene-diene polymers said halogenated butyl rubber forms at least 20 weight percent of said polymeric component and (b) a scorch retarding agent selected from at least one of the free acid and the aluminum, barium, calcium and magnesium salts of an oligomer of linoleic acid, said scorch retarding agent being present in an amount from about 0.5 parts to about 5 parts by weight per 100 parts by weight of said polymeric component.

3,928,260
OPAQUE WHITE COATING COMPOSITION COMPRISING ESSENTIALLY CELLULOSE ESTER/CROSS-LINKING AGENT/CATALYST/SOLVENT AND ORGANIC LIQUID

Ehrlich M. Eiland, Lower Burrell, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 410,684, Oct. 29, 1973, Pat. No. 3,869,305, which is a continuation-in-part of Ser. No. 170,647, Jan. 29, 1974, Pat. No. 3,788,886, which is a continuation of Ser. No. 781,977, Dec. 6, 1968, abandoned. This application Nov. 25, 1974, Ser. No. 526,640The portion of the term of this patent subsequent to Jan. 29, 1991, has been disclaimed.
Int. Cl.² C08L *1/10, 1/14*
U.S. Cl. 260—14 **7 Claims**

1. A coating composition capable of forming an opaque color when applied to a substrate and heat-cured thereon at a temperature as high as 750°F, said coating composition having as essential ingredients (a) a cross-linkable cellulose ester resin having an hydroxyl content of at least 4%; (b) a cross-linking agent compatible with said resin wherein said cross-linking agent is a condensation polymer of a compound selected from the group consisting of (1) a urea compound, (2) thiourea, (3) cyanamide, (4) guanidine, and (5) melamine reacted with a compound selected from the group consisting of (I) a lower aliphatic aldehyde and (II) a lower aliphatic aldehyde and alcohol; (c) a solvent for said resin and said cross-linking agent; (d) an acid catalyst adapted for cross-linking said resin with said cross-linking agent; and (e) an organic liquid adapted for mixing with the balance of said composition to form globules therein, said organic liquid comprising at least 85% by volume paraffinic hydrocarbons and having a boiling point of at least about 300°F.

3,928,261
PVA-PVC FIBERS AND PROCESS FOR THEIR PRODUCTION

Tadao Ashikaga, Akio Ohmori, Masasi Ando, Kurashiki, Japan, assignors to Kuraray Co. Ltd., Okayama Prefecture, Japan.

Continuation-in-part of Ser. No. 340,040, March 12, 1973, abandoned. This application July 8, 1974, Ser. No. 486,341.
Claims priority, application Japan, March 16, 1972, Ser. No. 47/26737.
Int. Cl.² C08L *27/06*
U.S. Cl. 260/45.75 **4 Claims**

1. Synthetic fibers having superior fire retardancy, light resistance and tenacity, said fibers consisting of a polyvinyl

alcohol having an average degree of polymerization of 500 to 3000 and a degree of saponification of at least 99.5 mol percent, polyvinyl chloride and boric acid, the weight ratio of polyvinyl alcohol to polyvinyl chloride being 90:10 to 55:45, the content of boric acid being 0.02 to 0.5 percent by weight based on the weight of the polyvinyl alcohol, said fibers being molecularly oriented in the direction of the fiber axis and having a hot water resistance of at least 110° C. even when not acetalized.

3,928,262

PRESSURE-SENSITIVE ADHESIVE COMPOSITIONS CONTAINING HYDROXY-ETHYL CELLULOSE

Tomoyoshi Ono, Hino, and Yoshihiko Matsuguma, Hachioji, both of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Nov. 26, 1973, Ser. No. 419,068

Claims priority, application Japan, Dec. 21, 1972, 47-127626

Int. Cl.[2] B32B *23/08;* **C08L** *1/26*

U.S. Cl. 260—17 R **3 Claims**

1. An adhesive composition comprising, of the total composition of 100 parts by weight, 90 – 99 parts by weight of a tacky copolymer obtained by copolymerizing

a. 75 – 95 mol percent of at least one alkyl acrylate, the alkyl group of which contains 1 to 14 carbon atoms and the average number of which carbon atoms is 4 to 12, or a mixture of at least one class of said alkyl acrylate with methyl methacrylate and/or vinyl acetate in a molar ratio of 5 or more to 1; with

b. 5 – 25 mol percent of acrylic acid and/or methacrylic acid, and 10 – 1 parts by weight of a hydroxyethyl cellulose.

3,928,263

PROCESS FOR PRODUCING POLYOLEFIN POWDERS WITH GRINDING AIDS AND POWDER COMPOSITION OF GRINDING AIDS AND POLYOLEFINS

Peter M. Grant, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1974, Ser. No. 456,514

Int. Cl.[2] B02C *19/18;* **C08L** *1/28*

U.S. Cl. 260—17 R **19 Claims**

1. A process for preparing polyolefin powders which comprises introducing a grinding aid into a crystalline polyolefin by melt compounding the grinding aid together with the crystalline polyolefin, extruding into pelleted form and grinding the pellets to form said polyolefin powders, the introduced grinding aid being a dissimilar and incompatible polymeric material having a softening point below 450°F. and a greater grindability than said polyolefin.

3,928,264

POLYMERIC ULTRAVIOLET LIGHT STABILIZERS PREPARED FROM PHENOL-FORMALDEHYDE CONDENSATES

Raymond H. Young, Jr., Macon, Ga.; Albert H. Markhart, Wilbraham, and Joseph G. Martins, Ludlow, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

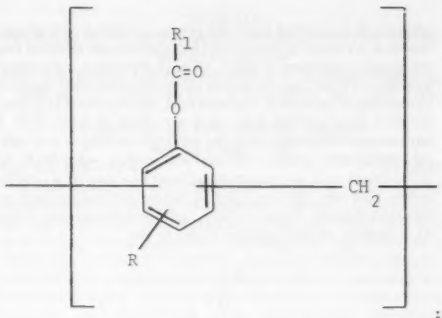
Division of Ser. No. 225,653, Feb. 11, 1972, Pat. No. 3,817,924, which is a continuation-in-part of Ser. Nos. 849,210, Aug. 11, 1969, Pat. No. 3,650,799, and Ser. No. 606,595, Jan. 3, 1967, abandoned. This application May 17, 1974, Ser. No. 470,788

Int. Cl.[2] C08L *6/08;* **C08G** *8/28*

U.S. Cl. 260—17.2 **12 Claims**

1. A synthetic resin polymer protected with an effective amount of a polymeric light stabilizer which is also a barrier to ultraviolet light, which stabilizer comprises a polymer comprising:

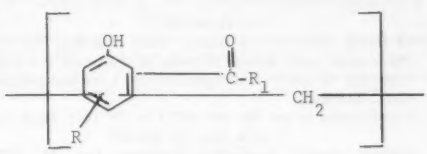
A. from 1 to 99 mol % of the following recurring unit:



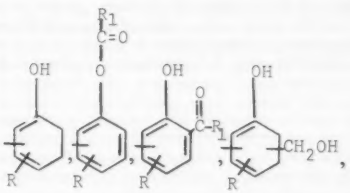
;

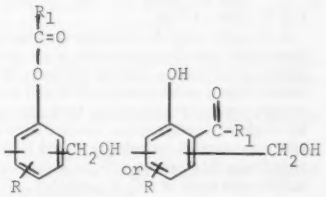
and

B. from 99 to 1 mol % of the following recurring unit:

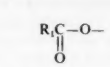


wherein the total number of recurring units is from 1 to 25; wherein the end groups are:





wherein R is selected from the group consisting of hydrogen, halogen, a radical of from 1 to 18 carbon atoms selected from the group consisting of alkyl, alkenyl, haloalkyl, and alkoxy, a radical of from 5 to 18 carbon atoms selected from the group consisting of cycloalkyl, cycloalkenyl, alkylcycloalkyl, halocycloalkyl and cycloalkyloxy, and a radical of from 6 to 18 carbon atoms selected from the group consisting of aryl, alkaryl, alkenylaryl, aralkyl; haloaryl and aryloxy; wherein R_1 is a monovalent radical containing at least one ring of six carbon atoms, said ring characterized by benzenoid unsaturation and attached directly to the carbonyl group; and wherein at least 12.5 mole % of the positions ortho to the



groups are unsubstituted.

3,928,265

LACQUER SYSTEMS WHICH ARE HARMLESS TO THE ENVIRONMENT

Rolf Dhein; Bernd-Ulrich Kaiser; Hans Rudolph; Rolf Küchenmeister, and Clemens Niehaus, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Continuation of Ser. No. 410, 687, Oct. 29, 1973. Filed Aug. 7, 1974, Ser. No. 495,407

Claims priority, application Germany, Oct. 31, 1972, 2253300

Int. Cl.² C08L *91/00*

U.S. Cl. 260—21 **4 Claims**

1. A composition comprising (A) a melamine formaldehyde condensation resin, (B) an alkyd resin having a molecular weight between 1500 and 5000, an acid number between 5 and 40 and a hydroxyl number between 40 and 140 and (C) a hydroxyl compound selected from the group consisting of ethylene glycol, propylene glycol, diethylene glycol, glycercl, bis-glycol adipate and castor oil, component (B) being present in an amount of 80 to 95% by weight, based on the combined weight of (B) and (C), component (C) being present in an amount of 5 to 20%, based on the combined weight of (B) and (C), and component (A) being present in an amount of 20 to 30 parts by weight for every 100 parts by weight of said composition.

3,928,266

COPOLYMER BINDER RESINS FOR TRAFFIC PAINTS

John M. Scohy, Vienna, W. Va.; George E. Cremeans, Groveport, and Manfred Luttinger, Columbus, both of Ohio, assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 29, 1974, Ser. No. 474,298

Int. Cl.² C08F *218/04*, *220/06*; C09D *3/66*

U.S. Cl. 260—22 CB **3 Claims**

1. A traffic paint formulation comprising an alkyd resin, a chlorinated paraffin plasticizer, a second binder resin, pigments, fillers and a solvent mixture, wherein said second binder resin is an alkyd compatible and aliphatic hydrocarbon soluble copolymer comprising from about 51% to about 90% by weight of an alkylstyrene selected from the group vinyltoluene, ethylstyrene, propylstyrene and butylstyrene and correspondingly from about 49% to about 10% by weight of an acrylic acid ester of a C_2–C_{10} alcohol.

3,928,267

LIQUID STABILIZER SYSTEM FOR POLYVINYL CHLORIDE

Philip H. Rhodes, and Robert L. Ahr, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

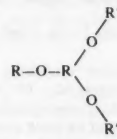
Division of Ser. No. 226,273, Feb. 14, 1972, Pat. No. 3,756,200. This application Mar. 5, 1973, Ser. No. 338,163

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 XA **5 Claims**

1. A method for stabilizing vinyl polymer resin to impart antifogging and antistatic properties and improve heat stability which comprises:

1. admixing at a temperature of 100°C to 200°C until solution has been effected (a) 5 to 50 parts by weight aliphatic or cycloaliphatic epoxy compound containing from 10 to 180 carbon atoms, (b) 1 to 35 parts polyvalent metal salt of a monocarboxylic acid containing from 6 to 26 carbon atoms and (c) 10 to 80 parts organophosphorous compound of the formula



wherein R is a hydrocarbon radical containing from 1 to 24 carbon atoms and selected from the group consisting of aryl, alkyl, alkaryl, aralkyl, and cycloaliphatic and R′ and R″ and hydrogen or R;

2. adding 35 to 85 parts of a partial ester of a polyglycerol having not more than 75% of the polyglycerol hydroxyl groups reacted and derived from a C_{6-24} monocarboxylic acid and a polyglycerol containing 2 to 30 condensed glycerol units; and

3. incorporating 0.5 to 25 parts by weight of the resulting liquid stabilizer into 100 parts polyvinyl chloride homopolymer or copolymer.

3,928,268

METHOD OF TREATING WASTE PLASTICS

Tsutomu Sato, Tokyo; Hiroshi Deura, Yachiyo, and Kenkichi Oba, Funabashi, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1974, Ser. No. 447,857

Claims priority, application Japan, Mar. 19, 1973, 48-032058

Int. Cl.² C08K *5/49*

U.S. Cl. 260—23 H **9 Claims**

1. A method of treating molded articles made of thermoplastic synthetic resin, wherein said resin is selected from the group consisting of polyolefin resins, polyvinyl chloride and polystyrene, to induce photodecomposition of said resin on exposure to ultraviolet radiation or sunlight, which comprises applying to the surface of said article an organic solvent solution of a composition consisting essentially of

A. a halogenide of a metal selected from the group consisting of manganese, iron, cobalt, nickel and copper, and

B. a triester of phosphorous acid of the formula

$$(RO)_3P$$

wherein each R is a member of the group consisting of alkyl, alkenyl, phenyl or alkylphenyl in the range of 1 to 20 carbon atoms;

the weight ratio of A:B being in the range of 1:1 to 1:10, said organic solvent solution containing from 1 to 30 parts by weight of said composition per 100 parts by weight of solvent.

3,928,269

ACID DYEABLE OLEFIN POLYMER CONTAINING QUATERNIZED AMINE GROUPS

Peter A. Taylor, and Tsung-Yuan Su, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 9, 1974, Ser. No. 504,071
Int. Cl.² C08L 23/08, 23/14
U.S. Cl. 260—23 AR 21 Claims

1. An acid dyeable composition produced by treating a polymer composition comprising a polymer of at least one aliphatic mono-1-olefin having 2 to 8 carbon atoms per molecule, and as a dye receptor, a copolymer of ethylene or propylene and an aminoalkyl acrylate with alkyl halide under conditions such that the alkyl halide reacts with dye sites in said dye receptor so as to obtain a composition susceptible to dyeing with acid dyes at a relatively high pH.

3,928,270

THERMOSETTING COMPOSITIONS

Aubrey South, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 8, 1973, Ser. No. 330,677
Int. Cl.² C08L 91/00
U.S. Cl. 260—23.7 M 21 Claims

1. A thermosetting molding composition comprising an at least substantially uniform mixture of at least one polymer of a conjugated diene having from 4 to 10 carbon atoms per molecule, said polymer having at least about 50 percent of the unsaturation thereof in the form of pendant vinyl groups; a particulate metal silicate filler; a silane coupling agent; an organic peroxide curing agent; and an organic acid or an anhydride thereof.

3,928,271

PROCESS FOR PREPARATION OF ANIONIC POLYURETHANE EMULSIONS

Kazuo Matsuda; Hidemasa Ohmura, and Hirakazu Aritaki, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 505,680
Claims priority, application Japan, Sept. 18, 1973, 48-105302
Int. Cl.² C08G 18/32; C08J 3/06
U.S. Cl. 260—29.2 TN 9 Claims

1. A process for preparing an anionic polyurethane emulsion, which comprises,

1. reacting, in the liquid phase and in a ketone solvent, at a temperature of from −20° to +70°C, (A) isocyanate-terminated urethane prepolymer prepared by reacting organic polyol having a molecular weight in the range of from 200 to 10000 with an excess of organic polyisocyanate, with (B) an excess of polyalkylene polyamine having at least two primary or secondary amino groups and also having a functional group of the formula $—CH_2—CH(OH)—CH_2X$, wherein X is chloro or bromo, the total mole number of primary and secondary amino groups in the polyalkylene polyamine being greater than the total mole number of isocyanate groups in the isocyanate-terminated urethane prepolymer, the reaction being carried out until the presence of —NCO groups cannot be detected, whereby to form polyurethane-urea-polyamine,
2. reacting, in the liquid phase, at a temperature of from 5° to 70°C, for from 0.5 to 2 hours, the reaction product of step 1 with cyclic dicarboxylic acid anhydride in an amount substantially equimolar to the amino groups of the polyurethane-urea-polyamine,
3. adding to the reaction product of step 2 an aqueous solution of a basic substance to adjust the pH of the product of step 2 to be in the range of about 6 to about 9, and
4. treating the product of step 3 to remove the organic solvent therefrom and thereby obtaining an aqueous anionic polyurethane emulsion as a final product.

3,928,272

PROCESS OF MAKING UREA-FORMALDEHYDE SOLID MICROSPHERES

Jack J. Brancato, Lincroft, and Daniel F. Herman, Princeton, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Mar. 25, 1974, Ser. No. 454,594
Int. Cl. C08g 51/24
U.S. Cl. 260—29.4 R 4 Claims

1. Preparation of spheroidal solid shaped microspheres of urea-formaldehyde, said microspheres having a surface area of from 10 to 90 m^2/gm. and having a diameter range from 0.2 μ to 4.0 μ, which comprises admixing with high shear at a temperature from 15°C. to 40°C. an aqueous solution of urea-formaldehyde prepolymer and a non-solvent containing an emulsifying agent to form water droplets in a water-in-oil emulsion, said emulsifying agent selected from the group consisting of the polymer of ethyl acrylate grafted onto polyethylene oxide and the sorbitol ester of long chain fatty acids having an HLB between 4.3 and 8.6, said urea-formaldehyde prepolymer dissolved in the water droplets, adding an acid catalyst to the emulsion to adjust the pH to fall within the range of from 2 to 5 during which time the prepolymer dissolved in the water droplets polymerizes and forms spherical shaped particles of urea-formaldehyde, aging the suspension for at least one hour, diluting the suspension with water, adding a dispersing agent, said dispersing agent selected from the group consisting of pigment dispersing agents, potassium tripolyphosphate, sodium hexametaphosphate and sodium lauryl sulfate, and then the neutralizing the diluted dispersed slurry to pH of 6.5 – 7.5, separating the spherical particles from the solvent and non-solvent and drying the particles.

3,928,273

METHOD OF MAKING ORGANIC SOLVENT FREE AQUEOUS COATING COMPOSITIONS OF ACRYLIC POLYMER LATEX, WATER SOLUBLE EMULSION-POLYMERIZED ACRYLIC POLYMER, AND AMINOPLAST

Yun-Feng Chang, Plymouth; Mo-Fung Cheung, Warren, and Ray A. Dickie, Birmingham, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed June 3, 1974, Ser. No. 476,116
Int. Cl.² C08L 29/02, 33/02, 61/24, 61/28
U.S. Cl. 260—29.4 UA 1 Claim

1. In a method for producing an aqueous dispersion of paint in which a carboxy-functional polymer is at least partially neutralized with a water-soluble amine and dispersed with an amino resin crosslinking agent selected from melamine-formaldehyde resins and urea-formaldehyde resins in an aqueous solution of water and water-soluble amine, the improvement wherein the aqueous dispersion is produced essentially free of organic solvents by intimately dispersing with said water, said amino resin crosslinking agent and said water soluble amine:

I. an aqueous emulsion consisting essentially of water, water-soluble amine, and about 50 to about 95 parts by weight of an emulsion polymer having functionality selected from carboxy functionality and hydroxy functionality and is a copolymer of acrylic monomers that:

A. is essentially insoluble in said aqueous solution;
B. has average molecular weight (M_n) in the range of about 3,000 to about 20,000, and
C. has Tg in the range of −15°C. to 50°C., and

II. about 5 to about 50 parts by weight of a solution polymer which is a carboxy-functional copolymer of acrylic monomers that:

A. is at least partially neutralized with water-soluble amine,
B. is soluble in said aqueous solution.
C. has average molecular weight (M_n) in the range of about 3,000 to about 20,000,

D. has Tg in the range of −15°C. to 50°C., and

E. has been prepared by emulsion polymerization in water of about 5 to about 25 mole percent of an alpha-beta olefinically unsaturated monocarboxylic acid selected from acrylic and methacrylic acid and 75 to 95 mole percent of other monoethylenically unsaturated monomers consisting essentially of monomers selected from the group consisting of monoacrylates, monomethacrylates and monovinyl hydrocarbons at a temperature between about 45°C. and the reflux temperature of the reaction mixture and subsequently at least partially neutralized with water-soluble amine in the water in which it is formed,

said amino resin crosslinking agent being present in an amount in the range of about 15 to about 35 weight percent of the sum of the weights of said solution polymer and said emulsion polymer.

3,928,274
PROCESS FOR PREPARING NITRILES

Jiban Kumar Chakrabarti, Frimley, England, assignor to Lilly Industries, Ltd., London, England

Filed Aug. 29, 1973, Ser. No. 392,845
Int. Cl.² C07D *213/57*; **C07C** *120/00*
U.S. Cl. 260—294.9 **3 Claims**

1. Process for preparing nitriles which comprises the essential step of reacting the corresponding aldoxime with cyanuric chloride in a mutual solvent in the presence of pyridine at a temperature in the range 20°–30°C. wherein said aldoxime is a C_2–C_6 alkanal oxime, a pyridyl aldoxime, a pyrrolyl aldoxime, benzaldoxime or a substituted benzaldoxime wherein said substitutents can be C_1–C_4 alkyl, C_1–C_4 alkoxy or nitro.

3,928,275
VINYL CHLORIDE RESIN COMPOSITION CONTAINING A LUBRICANT

Osamu Hiyama, and Kazuo Ito, both of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed July 23, 1974, Ser. No. 491,039
Claims priority, application Japan, July 24, 1973, 48-83313
Int. Cl.² C08K *5/09*, *5/11*; **B29F** *3/00*; **C08L** *27/06*
U.S. Cl. 260—31.8 B **6 Claims**

1. A vinyl chloride resin composition having incorporated therein, as lubricant, from 0.05 to 2.0 parts by weight, per 100 parts of a vinyl chloride resin, of a metal salt of a dialkyl citrate in which the alkyl groups contain a total of 26 to 44 carbon atoms and each of the alkyl groups contains from 12 to 22 carbon atoms, and the metal is selected from the group consisting of calcium, magnesium and zinc, said vinyl chloride resin being selected from the group consisting of polyvinyl chloride, copolymers containing at least 50 weight percent of vinyl chloride units and the balance is units of one or more monomers copolymerizable with vinyl chloride, and polymer blends containing at least 80 weight percent of polyvinyl chloride and the balance being another polymer compatible with polyvinyl chloride.

3,928,276
SALTS OF AMINE-ALKYLENE OXIDE ADDUCTS FOR PREVENTING SEDIMENTATION OF PIGMENT SUSPENSIONS

Heinz Linden, Dusseldorf-Holthausen; Jurgen Gartner, Hitdorf; Wilhelm Offermann, Dusseldorf, and Gunther Demmering, Solingen-Grafrath, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Jan. 29, 1973, Ser. No. 327,506
Claims priority, application Germany, Feb. 12, 1972, 2206691
Int. Cl.² C08K *9/04*
U.S. Cl. 260—34.2 **6 Claims**

1. In the process for preventing the sedimentation of pigment suspensions in varnishes with an organic solvent, comprising adding a sedimentation preventing agent to a varnish with an organic solvent containing a pigment, the improvement which consists of utilizing a salt from tertiary and/or quaternary amine-alkylene oxide adducts and organic acids of the formula

$$K_x \cdot Y$$

wherein Y is an anion of an acid selected from the group consisting of fatty acids having 1 to 37 carbon atoms and dimeric fatty acids having 12 to 36 carbon atoms; x is an integer from 1 to 2; and K is a cation of the formula selected from the group consisting of

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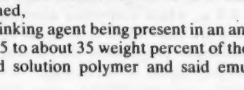
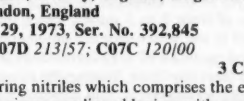
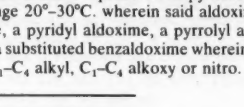


wherein R_1 is selected from the group consisting of alkyl having 2 to 24 carbon atoms and alkenyl having 3 to 24 carbon atoms, a is an integer from 2 to 4, m and n are integers whose sum is from 2 to 40,

(B)


wherein R_1 and a each have the above-defined meaning, and m is an integer from 2 to 40, and

(C)


wherein R_1 and a each have the above-defined meaning, and m, n and p are integers whose sum is from 3 to 100, as said sedimentation preventing agent.

3,928,277
MOULDING COMPOSITIONS

George L. Wicker, 1 Lowhouse Close, Milnrow, Lancashire, England

Continuation-in-part of Ser. No. 260,153, June 6, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,252
Int. Cl.² C08K *3/22*, *5/03*, *7/12*
U.S. Cl. 260—37 N **3 Claims**

1. A fire resistant thermoplastic composition comprising

a. from 40 to 90 percent by weight of a thermoplastic polymer selected from the group consisting of polypropylene, copolymers of propylene, polyethylene, polystyrene, styrene/acrylonitrile copolymers, polyamides and mixtures thereof; and

b. a fire-retardant additive consisting essentially of

i. from 5 to 40 percent by weight of chrysotile asbestos fibres; and

ii. from 2.5 to 20 percent by weight of an additive mixture of antimony trioxide and at least one halogenated hydrocarbon selected from the group consisting of decabromodiphenyl and the double Diels-Alder condensation product of hexachlorocyclopentadiene and cyclooctadiene.

3,928,278

COUPLING AGENTS FOR CHRYSOTILE ASBESTOS AND THERMOPLASTIC POLYMERS

Raymond George Azrak, Whitehouse Station; Fred Harpoth Ancker, Warren Township, and Michael Dean Bertolucci, Martinsville, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,232
Int. Cl.² C03C *25/02*; **C08K** *3/34*
U.S. Cl. 260—40 R **17 Claims**

1. A composition comprising a thermoplastic polymer reinforced with chrysotile asbestos filler, which composition contains sufficient first phenolic composition at the interface of said filler and said thermoplastic polymer to increase the tensile strength of an article molded from said reinforced polymer, wherein said first phenolic composition is obtained by heating a second phenolic composition which is a member selected from the group consisting of:

a. a first phenol having at least one orthohydroxymethyl group;

b. a resole derived from a phenol having an oleophilic substituent in the para position;

c. a first novolak having the methylene bridges between phenolic nuclei at least predominantly bonded to the positions ortho to the phenolic hydroxyls;

d. a second novolak derived from a phenol having an oleophilic substituent in the para position, said second novolak being employed in combination with a reactive material capable of reacting with said second novolak at elevated temperature to effect linear advancement thereof;

e. a second phenol having at least one unsubstituted position ortho to the phenolic hydroxyl, or having at least one reactive substituent group ortho to the phenolic hydroxyl, and having an oleophilic substituent in the para position, said second phenol being employed in combination with a reactive material capable of reacting with said second phenol at elevated temperature to effect linear advancement thereof.

3,928,279

GLASS FIBER-CONTAINING AROMATIC POLYESTER COMPOSITION

Hiroo Inata; Shoji Kawase, and Takeo Shima, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 22, 1974, Ser. No. 454,006
Claims priority, application Japan, Mar. 26, 1973, 48-34879
Int. Cl.² C08K *3/40*, *5/38*
U.S. Cl. 260—40 R **9 Claims**

1. An aromatic polyester composition containing glass fibers, comprising 100 parts by weight of an aromatic polyester resin selected from the group consisting of poly(alkylene terephthalate) resins containing at least 80% by weight of alkylene terephthalate units and poly(alkylene naphthalate) resins containing at least 80% by weight of alkylene naphthalate units, 3 to 70 parts by weight of glass fibers and a stabilizer to protect against heat deterioration consisting essentially of 0.01 to 5 parts by weight, per 100 parts by weight of said aromatic polyester resin, of a thiodipropionic acid diester.

3,928,280

PREPARATION OF DENTAL RESTORATIVE FILLING MATERIALS

Wallace A. Erickson, Chicago, and Byoung Sub, Oak Park, both of Ill., assignors to Wallace A. Erickson & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 231,736, March 3, 1972, abandoned. This application July 5, 1974, Ser. No. 485,979
Int. Cl.² C08F *29/50*; **B08J** *11/54*
U.S. Cl. 260—42.28 **8 Claims**

1. A unitary dental restorative material pack comprising:

a paste-like phase containing a polymerizable component comprising the reaction product of a bisphenol and a glycidyl acrylate or methacrylate;

a sheet-like substrate carrying on its surface a controlled removable layer of a solid organic peroxide catalyst for the polymerization of said polymerizable component;

the pack having means to prevent premature contact between said catalyst and said polymerizable components; said catalyst being available for incorporation into said paste-like phase, in sufficient quantity to catalyze the polymerization of said polymerizable component, on spatulation of said paste-like phase on the surface of said substrate.

3,928,281

BACKING AGENT FOR CARPET

Taku Uchigaki, and Masataka Noro, both of Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Sept. 3, 1974, Ser. No. 502,339
Claims priority, application Japan, Sept. 3, 1973, 48-98221
Int. Cl.² C08K *3/34*, *3/26*
U.S. Cl. 260—42.39 **6 Claims**

1. A backing agent for adhering a carpet backing to a carpet comprising

1. a mixture of about 90 to 20 percent by weight of atactic polypropylene having a molecular weight of 2,000 to 100,000 and about 10 to 80 percent by weight of a urethane prepolymer having a molecular weight of 1,000 to 10,000, an amine equivalent of about 1,100 to 1,200 and having an isocyanate group at the terminals of the molecule, and

2. about 5 to 60 percent by weight of a non-porous inorganic filler based on the total weight of said mixture and said inorganic filler, said backing agent having a viscosity when applied of 3,000 to 10,000 cps and said urethane prepolymer being an addition polymerization product between at least one diisocyanate compound having an isocyanate group at the terminals of the molecule and at least one diol compound.

3,928,282

BLEND OF HIGH-VINYL POLYBUTADIENE AND HYDROFORMYLATED HIGH-VINYL POLYBUTADIENE

Delmar F. Lohr, Jr., Akron, and Jung W. Kang, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Sept. 9, 1974, Ser. No. 504,648
Int. Cl.² C08K *9/06* **C08L** *9/00*
U.S. Cl. 260—42.44 **2 Claims**

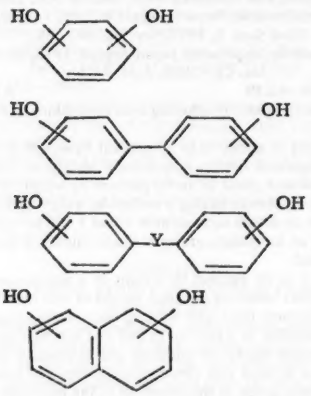
1. A blend of resin with a dilute solution viscosity of 0.05 to 0.7 and composed essentially of (a) 5 to 95 parts by weight of a resin of butadiene homopolymer in which at least 80 per cent of the repeating butadiene units are in the 1,2-configuration and (b) 95 to 5 parts by weight of hydroformylated butadiene homopolymer obtained from homopolymer in which at least 80 per cent of the repeating units are in the 1,2-configuration; the carbonyl content of the hydroformylated homopolymer varying from 0.1 to 10.0 weight per cent and its hydroxyl content varying from 0.1 to 10.1 meq per gram, and the molecular weight of each component of the blend being 1,000 to 200,000, together with (c) 100 to 500 parts by weight of silica and (d) 0.5 to 5 parts by weight of an unsaturatedgroup-containing silane silica-to-resin bonding agent, the parts by weight of the silica and bonding agent being based on 100 parts of the combined weights of the homopolymer and hydroformylated homopolymer.

3,928,283
FIREPROOF, THERMOPLASTIC POLYESTER COMPOSITION

Yukito Masai, Otsu; Yasuo Kato, Shiga; Ken Murayama, Iwakuni, and Nobuhiko Fukui, Otsu, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha (Toyo Spinning Co., Ltd.), Japan

Filed Mar. 9, 1971, Ser. No. 122,367
Claims priority, application Japan, Mar. 9, 1970, 45-19880
Int. Cl.² C08K *5/53*
U.S. Cl. 260—45.7 P **5 Claims**

1. A fireproof, thermoplastic polyester composition having a viscosity and degree of polymerization suitable for melt spinning into filaments, which comprises a polyester and a polyaryl phosphonate incorporated therein in an amount of 0.7 to 4.0 weight % as phosphorus to the polyester, the said polyaryl phosphonate being not less than 6 in the degree of polymerization and containing as its diol component at least one of the aromatic diol compounds of the formulae:



wherein Y is alkylidene or cycloalkylidene having 1 to 6 carbon atoms and the phenyl radicals may bear one or more alkyls.

3,928,284
ORGANOTIN COMPOUNDS STABILIZERS FOR VINYL HALIDE POLYMERS

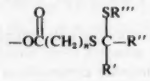
John D. Collins, Albrighton; Harold Coates, Wombourn, and Iftikhar Hussain Siddiqui, Birmingham, all of England, assignors to Albright & Wilson Limited, Oldburg near Birmingham, England

Division of Ser. No. 308,018, Nov. 20, 1972, abandoned. This application Apr. 24, 1974, Ser. No. 463,452
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.75 S **19 Claims**

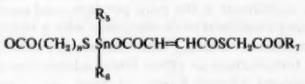
1. A resin composition stabilized against the deteriorative effects of heat, the composition comprising

1. a halogen-containing resin selected from the group consisting of homopolymers of vinyl chloride and vinylidene chloride, chlorinated polyethylene and copolymers of vinyl chloride or vinylidene chloride with ethylenically unsaturated monomers and
2. an organotin stabilizer of the general formula

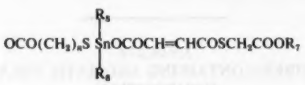
where R and R_1 are the same or different and are C_1 to C_{12} alkyl groups, cycloalkyl groups or phenyl groups,
X is



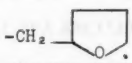
where
R′ is hydrogen, C_1 to C_{20} alkyl, cycloalkyl, phenyl, hydroxyphenyl or methoxyphenyl
R″ is C_1 to C_{20} alkyl, phenyl, hydroxyphenyl or methoxyphenyl wherein R_2 is a short chain alkyl group of 1 to 8 carbon atoms
R‴ is R_3 or $-(CH_2)_nCOOR_3$
where R_3 is an alkyl radical of from 1 to 20 carbon atoms, a cycloalkyl group or a phenyl group and n is an integer from 1 to 4 or
X is



where R_5 and R_6 are selected from the same groups and R and R_1, and R_7 is selected from the same groups as R′ and Y is either the same as X or is different from X and is selected from the same group of radicals as X or is $S(CH_2)_nCOOR_4$ or $OOCCH{=}CHCOOR_4$ or is $OOCCH{=}CHCOSCH_2COOR_4$ if X is



where R_4 is an alkyl group of from 1 to 20 carbon atoms, a cycloalkyl, phenyl or



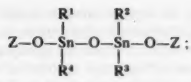
group.

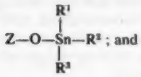
3,928,285
SYNERGISTIC ORGANOTIN BORATE STABILIZER COMPOSITION AND RESINS CONTAINING SAME

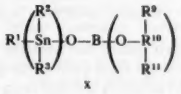
Robert George Gough, and Francis Joseph Buescher, both of Cincinnati, Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Jan. 16, 1975, Ser. No. 541,495
Int. Cl.² C08G *6/00*
U.S. Cl. 260—45.75 K **21 Claims**

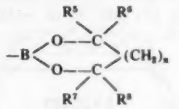
10. A plastic composition having improved resistance to early color formation during processing comprising (1) a vinyl halide homopolymer, vinyl halide copolymer or polymer blend containing a vinyl halide homopolymer or vinyl halide copolymer, (2) an organic thiol compound having a molecular weight per thiol group of from 40 to 400 and a boiling point of at least 180° C at one atmosphere pressure, and (3) an organotin borate which is a member selected from organotin borates having the following general formulae

(a) 

(b) 

(c) 

where R^1, R^2, R^3, R^4, R^9, R^{10} and R^{11} are the same or different and are an aryl group, aralkyl group, alkaryl group or C_1 to C_8 alkyl group, x is 0, 1 or 2 and Z is



where R^5 and R^7 are hydrogen or C_1 to C_4 alkyl group, R^6 and R^8 are C_1 to C_4 alkyl group and n is 0, 1 or 2, said organotin borate and said organic thiol compound being present in a stabilizing effective amount.

3,928,286

HEAT-RESISTANT ADHESIVE COMPOSITION FROM A BIS-MALEIMIDE, AN ALPHA-CYANOACRYLATE AND OPTIONALLY A DIAMINE

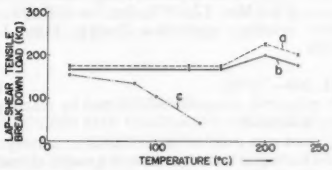
Keiiti Akiyama, Yokosuka; Shyuichi Suzuki, and Yukihiro Mikogami, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 1, 1974, Ser. No. 456,609

Claims priority, application Japan, Apr. 24, 1973, 48-45717; Aug. 6, 1973, 48-87620; Sept. 27, 1973, 48-107993

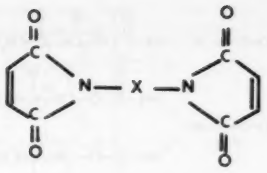
Int. Cl.² C08G *69/26*

U.S. Cl. 260—47 UA **7 Claims**

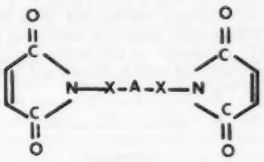


1. A heat-resistant solid adhesive composition consisting essentially of the polymeric reaction product of:

85 to 1 mol% of at least one N,N′-substituted bismaleimide selected from the group consisting of the bismaleimide represented by the formula

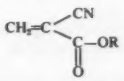


and those represented by the formula



where X is a member selected from the group consisting of alkylene, cycloalkylene and arylene groups, and A is a member selected from the group consisting of oxygen, methylene, carbonyl, sulfonyl, and —CONH—groups; and

15 to 99 mol% of at least one α-cyanoacrylate represented by the formula



where R is a member selected from the group consisting of C_1 to C_8 alkyl groups and cyclohexyl group.

3,928,287

COMPOSITION CONTAINING UNSATURATED MONOMERS AND POLYMERIZABLE BY IONIZING RADIATION

Karl Jellinek, Letmathe, and Rudi Oellig, Duisburg-Meiderich, both of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt, Germany

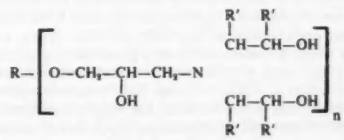
Filed Aug. 26, 1974, Ser. No. 500,813

Claims priority, application Germany, Sept. 6, 1973, 2344843

Int. Cl.² C08G *18/00*

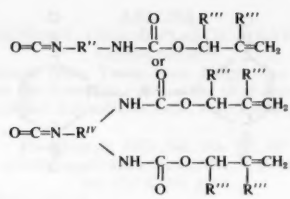
U.S. Cl. 260—47 CB **12 Claims**

1. A composition polymerizable by ionizing radiation, said composition comprising a mixture of at least one vinyl monomer, at least one allyl monomer or a mixture of at least one vinyl monomer and allyl monomer, and a compound copolymerizable with said monomers, said compound comprising the reaction product of (A) at least half of the hydroxyl groups in a polyol of the formula:



(I)

said polyol being the reaction product of an epoxy compound and a dialkanolamine in a stoichiometric ratio between amine hydrogen and epoxy groups, with (B) a monoisocyanato-allyl carbamate or monoisocyanato-methallyl carbamate of the formulas:



(II)

(III)

wherein R is a C_1–C_{10} alkyl, cycloalkyl, aryl or aralkyl radical having a valency of from 1 to 10; each R′ is independently selected from hydrogen, methyl and ethyl; R″ is a C_1–C_{10} alkylene, cycloalkylene, arylene or aralkylene group; R^{IV} is a trivalent aryl, carbamate or carbamide group; each R‴ is independently selected from hydrogen and methyl and *n* is a number from 1 to 10.

3,928,288

EPOXY NOVOLAC RESINS HAVING A NARROW MOLECULAR WEIGHT DISTRIBUTION AND PROCESS THEREFOR

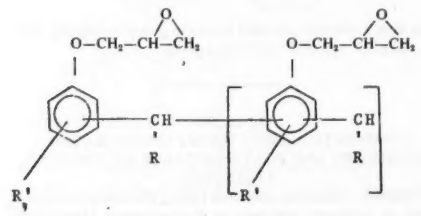
Eddie Bob Walker, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

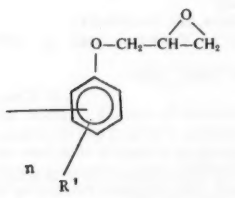
Continuation-in-part of Ser. No. 350,277, April 11, 1973, abandoned. This application May 31, 1974, Ser. No. 475,015

Int. Cl.² C08G *59/08*

U.S. Cl. 260—59 EP **8 Claims**

1. An epoxy novolac resin having a relatively narrow molecular weight distribution represented by the general formula





wherein each R is independently hydrogen or an alkyl group having from 1 to about 5 carbon atoms, each R′ is independently hydrogen, chlorine, bromine, an alkyl group having from 1 to about 6 carbon atoms or a glycidyloxy group and *n* has an average value greater than 0.1 and such that the viscosity in centistokes at 70°C to average EEW, epoxide equivalent weight, ratio is less than 11:1 when the weight average molecular weight of the resin is below about 2000 and a plot of Mw vs Mw:Mn falling on or within the area bounded by A,B,C,D in FIG. **1** when the weight average molecular weight is above about 2000.

3. A process for preparing an epoxy novolac resin having a relatively narrow molecular weight distribution which comprises

A. dissolving an epoxy novolac resin having a relatively wide molecular weight distribution in a solvent or mixture of solvents selected from the group consisting of xylene, toluene, methyl isobutyl ketone, solvents selected from those with solubility parameters of 8.0–9.0 with low to medium hydrogen bonding and those with solubility parameters >11.5 and any hydrogen bonding value at a temperature between about 50°C and the boiling point of the solvent, wherein the quantity of solvent is from about 30% to about 90% by weight of the combined weight of solvent and resin,

B. cooling the resultant solution to a temperature between below about 50°C and the freezing point of the solvent for a period of time sufficient to cause a separation into two distinct phases,

C. separating the two phases one from the other,

D. removing the solvent from each of the phases;

thereby producing (1) an epoxy novolac resin of relatively low molecular weight and (2) an epoxy novolac resin of relatively high molecular weight and wherein the weight average molecular weight of resin (1) is below about 2000 and for resin (2) above about 2000, and wherein the viscosity in centistokes at 70°C to average EEW, epoxide equivalent weight, ratio of resin (1) is below about 11:1 and wherein a plot of Mw vs Mw:Mn for resin (2) falls on or within the boundary of A,B,C,D in FIG. **1**.

3,928,289

HYDANTOIN PRODUCED POLYURETHANE

Charles B. Reilly, Uniontown, and Robert K. Rossi, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 26, 1973, Ser. No. 428,594

Int. Cl.² C08G *18/38*

U.S. Cl. 260—75 NQ **3 Claims**

1. A polyurethane prepared by reacting a mole of a reactive hydrogen material of 700 and higher molecular weight selected from the class consisting of polyester polyols and polyether polyols, with 1.2 to 3.5 moles of organic polyisocyanate and 0.2 to 2 moles of hydantoin containing dihydroxy alkyl and dialkyl substituents where the alkyl radical contains from 1 to 10 carbon atoms.

3,928,290

ENAMELING VARNISHES BASED ON AROMATIC CARBOXYLATES REACTED WITH POLYISOCYANATES AND POLYOLS

Choua Cohen, Grenoble; Bruno Durif-Varambon, Eybens; Robert Salle, Rue Pierre Loti, and Bernard Sillion, Grenoble, all of France, assignors to Institut Francais du Petrole, des Carburants & Lubrifiants, Paris, France

Filed Mar. 12, 1974, Ser. No. 450,426

Claims priority, application France, Mar. 14, 1973, 73.09220

Int. Cl.² C08G *18/34*

U.S. Cl. 260—75 TN **18 Claims**

1. A polymeric composition obtained by reacting simultaneously in solution:

a. at least one ester of an aromatic aminopolycarboxylic acid having at least 2 carboxylic groups, in relative position other than ortho or peri, and at least one amine function in ortho position with respect to one of the carboxylic groups;

b. at least one ester of an aromatic polycarboxylic acid, having at least two carboxylic groups in relative positions other than ortho or peri, with the provision that of the total of carboxylic acid groups of (a) and (b), said at least one ester of an aromatic amino polycarboxylic acid amounts to 20 to 60% of said total and said at least one ester of an aromatic polycarboxylic acid amounts to 40 to 80% of said total;

c. at least one polyisocyanate compound, in a proportion corresponding, in isocyanate equivalents, to 90–200% of the amine groups; and

d. at least one polyhydroxy compound, at least a part of which consists of at least one polyol containing at least three hydroxy groups, in such a proportion that the sum of the hydroxy groups and amine groups is higher than the sum of the ester groups and isocyanate groups.

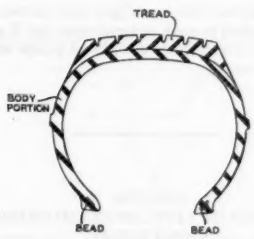
3,928,291
TIRE TREADS AND THEIR PRODUCTION

Joseph C. Sanda, Jr., Youngstown, N.Y., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 260,792, June 8, 1972, abandoned. This application Sept. 12, 1974, Ser. No. 505,426

Int. Cl.² C08G 8/76

U.S. Cl. 260—75 R **10 Claims**



1. A tread of a pneumatic tire which comprises the chain-extending reaction product of a chain-extending di(carbonyl halide) of the formula Hal—O:C—C:O—Hal or Hal—O:C—X—C:O—Hal in which Hal is chlorine or bromine and X is an aliphatic or aromatic hydrocarbon moiety, and a polymer from the class consisting of (a) polyhydroxy homopolymers and copolymers of conjugated dienes which contain 4 to 6 carbon atoms, (b) polyhydroxy copolymers of such a diene and an aromatic vinyl monomer, (c) polyhydroxy copolymers of such a diene and an aliphatic vinyl nitrile monomer, (d) polyhydroxy polyisobutylene and ethylene-propylene copolymer, (e) polyhydroxy polyethers and (f) polyhydroxy polyesters, which polymers contain 2 or 3 hydroxy groups with sufficient reinforcing pigment for a tire tread.

3,928,292
PROCESS FOR PREPARING COLORED POLYURETHANE

Shigeo Maeda; Minoru Ozutsumi; Isao Niimura, and Hideo Okazaki, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

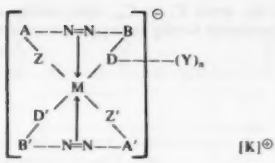
Continuation-in-part of Ser. No. 387,504, Aug. 10, 1973. This application Sept. 11, 1974, Ser. No. 505,144

Int. Cl.² C08G 18/32

U.S. Cl. 260—77.5 AQ **8 Claims**

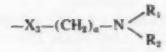
1. A process for preparing a colored polyurethane material, which comprises:

reacting a polyisocyanate compound and a polyhydroxyl compound with a 2:1 complex metal azo dye of the formula:



wherein A and A′ can be the same or different and each can represent a residual phenylene radical which can have a non-dissociated substituent; B and B′ can be the same or different and each represents a residual coupling component which can have a non-dissociated substituent and which have the metal coupling D and D′ groups disposed in an ortho relationship to the bridging azo groups; Z and Z′ can be the same different and each represents an —O— or —COO— group which is disposed in an ortho relationship to the bridging azo groups through groups A and A′; D and D′ can be the same or different and each represents —O—, —NH—, or —N—alkyl; M represents a chromium or cobalt atom; $[K]^+$ represents aliphatic and substituted aliphatic ammonium or acyclic ammonium; *n* represents an integer from 1 to 6 and Y represents

or



wherein R_1 and R_2 represent hydrogen, lower alkyl, amino or hydroxy substituted lower alkyl, N-alkylamino or N-hydroxyalkylamino-substituted lower alkyl groups wherein at least one of the R_1 and R_2 groups is an active hydrogen atom; and R_1 and R_2 can be cyclized together to form a hetero six membered ring with the nitrogen containing imino group; X_3 represents $—SO_2—$, $—NHSO_2—$, —CO— or —NHCO—; and *a* represents an integer from 1 to 4.

3,928,293
POLYMERIC REAGENT

Guy A. Crosby, Palo Alto, Calif., assignor to Dynapol, Palo Alto, Calif.

Filed Apr. 1, 1974, Ser. No. 456,731

Int. Cl.² C08F 28/02

U.S. Cl. 260—79 **9 Claims**

1. A polymeric boron hydride reagent comprising a particulate, solid, cross-linked aliphatic, cycloaliphatic, or aromatic organic polymer containing a substantial plurality of sulfur atoms in a thioether configuration and, in complex combination with a major proportion of said sulfur atoms, boron hydride molecules.

3,928,294
BIOCOMPATIBLE ARTICLES INCLUDING POLYMERIC MEMBRANES HAVING HIGH PERMEABILITY TO GASES AND USES THEREOF

James E. Crawford, Adrian, Mich., and Don N. Gray, Sylvania, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

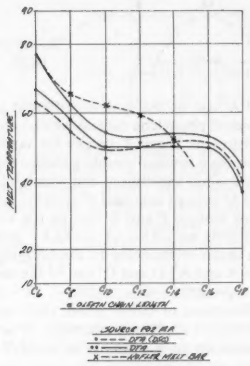
Continuation-in-part of Ser. No. 279,877, Aug. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 228,240, Feb. 22, 1972, abandoned. This application Feb. 2, 1973, Ser. No. 328,972

Int. Cl.² C08F 13/06 A61B 1/00, 13/00; A61F 1/22

U.S. Cl. 260—79.3 A **5 Claims**

1. As an article of manufacture, a permselective, biocompatible membrane article having high gaseous permeability, said membrane consisting of a poly(alpha-olefin-sulfone)

derived from the series C_8 to C_{18} alpha-olefins and sulfur dioxide, the membrane having an oxygen transmission rate of



about 1 to 4×10^{-4} cc mil./in² yr atm. and a CO_2 transmission rate of about 4 to 17×10^{-4} cc mil./in² yr atm.

3,928,295

AROMATIC POLYMERS CONTAINING KETONE LINKING GROUPS AND PROCESS FOR THEIR PREPARATION

John Brewster Rose, Letchworth, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 7, 1974, Ser. No. 467,798

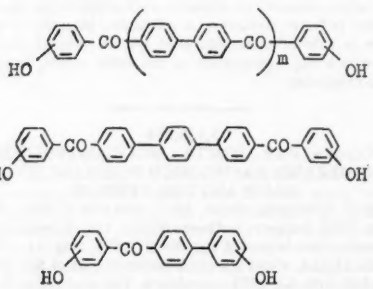
Claims priority, application United Kingdom, May 25, 1973, 25202/73; May 25, 1973, 25205/73; June 22, 1973, 29682/73; Oct. 12, 1973, 47684/73; Dec. 20, 1973, 59060/73; Mar. 14, 1974, 11443/74

Int. Cl.² C08G *2/00*, *75/20*

U.S. Cl. 260—79.3 M **14 Claims**

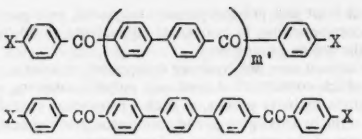
1. A process for the preparation of aromatic polymers having reduced viscosity of between 0.8 and 3.0, as measured at 25°C on a solution of polymer in concentrated sulphuric acid of density 1.84 g/cm³ containing 1 g of polymer in 100 cm³ of solution, which comprises heating at a temperature of 250°C to 400°C a monomer mixture comprising

1. 49 to 50% molar of a di(alkali metal) salt of at least one bisphenol selected from

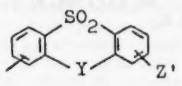


at least 95% of the phenolic OH groups being in the para position, and

2. 51 to 50% molar of at least one dihalo compound selected from



where X is F, Cl or Br, and each of *m* and *m'* is zero, 1, 2 or 3, and the molar percentages of said di(alkali metal) salt and said at least one dihalo compound sum to 100%, and in which monomeric mixture 0 to 25 mole % of the —CO— groups are replaced by sulphone groups, said di(alkali metal) salt being present as a suspension in a diaryl sulphone having the formula



in which Y is a direct link, an oxygen atom or two hydrogen atoms (one attached to each benzene ring) and Z and Z' are selected from hydrogen atoms and phenyl groups and may be the same or different.

3,928,296

STABILIZATION OF VINYLIDENE CHLORIDE/DIENE COPOLYMERS

Ronald W. Kavchok, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 25, 1974, Ser. No. 445,362

Int. Cl.² C08G *6/00*

U.S. Cl. 260—80.73 **7 Claims**

1. A process of preparing a heat stable conjugated 1,3-diene/vinylidene chloride polymer comprising polymerizing in a free radical, emulsion polymerization system a monomer system comprising at least 40 parts by weight of conjugated 1,3-diene monomer selected from the group consisting of 1,3-butadiene, isoprene and 2,3-dimethyl-1,3-butadiene; at least 20 parts by weight of vinylidene chloride; 0.5 to 10 parts by weight of an amide stabilizer and 0 to 25 parts by weight of other non-diene monomer per 100 parts by weight of total monomer, wherein the amide stabilizer is selected from the group consisting of N-(4-anilinophenyl) acrylamide and N-(4-anilinophenyl) methacrylamide.

3,928,297

HIGH MOLECULAR WEIGHT, HIGH UNSATURATION ISOBUTYLENE-CONJUGATED DIENE COPOLYMERS

Warren A. Thaler, Matawan; Donald J. Buckley, Plainfield, both of N.J., and Joseph P. Kennedy, Akron, Ohio, assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 151,038, June 8, 1971, Pat. No. 3,808,177. This application Apr. 1, 1974, Ser. No. 457,109

Int. Cl.² C08F *210/12*

U.S. Cl. 260—85.3 R **10 Claims**

1. A substantially gel-free copolymer consisting essentially of a major portion of isobutylene and about 5 to about 40 mole percent of cyclopentadiene, said copolymers having a number average molecular weight of at least 120,000.

3,928,298

POLYETHERS CONTAINING HYDANTOIN RINGS AS ANTISTATIC AGENTS FOR SYNTHETIC FIBERS AND FOILS

Gerhard Dieter Wolf, Dormagen; Helmut Engelhard, Leverkusen, and Francis Bentz, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Sept. 14, 1973, Ser. No. 397,419

Claims priority, application Germany, Sept. 15, 1975, 2245335

Int. Cl.² C08F *122/30*

U.S. Cl. 260—88.7 B **8 Claims**

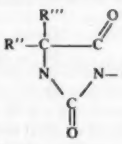
1. A fiber, thread or foil of a synthetic polyacrylonitrile polymer with permanent antistatic properties, which contains 0.5–15 percent, by weight of the total, of polyethers containing hydantoin rings as represented by the formula

$X - (OC_nH_{2n})_p - (OC_mH_{2m})_q - Hyd - R'$

in which

X represents hydrogen or the group

Hyd represents a bivalent group of the formula



R represents a C_{1-18}-alkyl, cycloalkyl, aryl, aralkyl or alkaryl group or halogen alkyl, NO_2 or CN derivatives thereof;

R′ has the meaning given for R or represents the group $-(C_mH_{2m}O)_q-(C_nH_{2n}O)_p-X$;

R″ and R‴ represents a C_{1-4} alkyl or aryl group or together represent a C_{5-6} cycloalkyl group;

n and m represent an integer or from 2 to 6; and

p and q represent O or an integer of from 1 to 50, and at least p or q > O.

3,928,299

POLYMERS WHICH CONTAIN URETHANE GROUPS AND WHICH ARE CROSS-LINKABLE BY VINYL POLYMERISATION

Hans Jurgen Rosenkranz, Krefeld; Hans Rudolph, Krefeld-Bockum; Erich Wolff, Leichlingen, and Harald von Rintelen, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

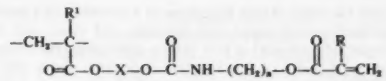
Continuation-in-part of Ser. No. 247,758, April 26, 1972, abandoned. This application Sept. 13, 1973, Ser. No. 397,161

Claims priority, application Germany, Apr. 30, 1971, 2121252

Int. Cl.² C08G *22/04*

U.S. Cl. 260—89.5 N **1 Claim**

1. An organic homopolymer or random copolymer having a number average molecular weight, determined by the osmometric method, of greater than 1,000 which contains per molecule y recurring units of the formula



wherein

R and R^1 are hydrogen or alkyl having 1 to 4 carbon atoms,

n is an integer from 1 to 6,

y is an integer from 2 to 500 and

X is an alkylene group having 1 to 9 carbon atoms or an alkylene group having 2 to 9 carbon atoms interrupted by from one to two -O- groups.

3,928,300

FALLING STRAND DEVOLATILIZATION TECHNIQUE

Carl G. Hagberg, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 9, 1973, Ser. No. 322,261

Int. Cl.² B01D *1/08, 1/22, 1/28*

U.S. Cl. 260—93.5 A **6 Claims**

1. In a continuous process for the devolatilization of homopolystyrene, said process using as a starting process fluid a composition comprising from about 50 to 85 weight percent homopolystyrene and correspondingly about 50 to 15 weight per cent styrene monomer to falling strand devolatilization of the type wherein said composition is subjected first to heating and then to flash vaporization of said monomer, said composition being at an initial input temperature of from about 130° to 200°C. and at initial input pressure of from about 5 to 50 psi, the improvement in such a process which comprises the steps of:

A. passing said composition through a plurality of heating zones:

1. each of said heating zones having a generally columnar shape,
   a. each one of such heating zones having:
      a length of from about 2 to 8 feet,
      an average inside diameter which is generally constant with respect to said length thereof and which ranges from about 0.5 to 1.5 inches,
      a ratio of said length to said diameter ranging from about 30 to 80, and
   b. the relationship between said composition and all of said heating zones being such that the amount of said composition flowing through said zones ranges from about 3 to 20 lbs./hr./heating zone,
2. each of said heating zones having its side wall portions defined by a heat exchange solid surface whose total heat flux relative to said composition passing therealong ranges from about **500** to **4000** BTU/hr./ft.²,
3. the residence time of each portion of said composition in a given one of said heating zones ranging from about 2 to 10 minutes,
4. the output temperature of said composition as it exits from each individual one of said heating zones ranging from about 40 to 160°C. greater than said input temperature,
5. the output pressure of said composition as it exits from each individual one of said heating zones being from about 5 to 50 psi less than said input pressure, and
6. said plurality of heating zones being tubes encased in a body section of a shell and tube heat exchanger assembly, said tubes being generally equally spaced throughout said assembly, said composition flowing as a plurality of strands from the bottom section of said assembly,

B. discharging said strands of said composition from each of said tubes of said assembly into a flash vaporization zone, downwardly through a central region of said flash zone, wherein said monomer vapor is separated from said homopolystyrene, said assembly being recessed in an upper region of said flash zone defining an annular area

with the walls of said flash zone as a manifold-like device, collecting said vapor and directing said vapor out of a vapor take-off port in said device, controlling the temperature of said flash vaporization zone from about 180° to 280°C. and the pressure of said flash vaporization zone from about 2 to 800 mm Hg abs while continuously removing from said flash vaporization zone said monomer vapor at a rate at least approximately equal to the rate of generation thereof in said flash vaporization zone.

3,928,301
POLYMERS OF 2-ETHYL-1,3-BUTADIENE AND METHOD OF THEIR PREPARATION

James Neil Henderson, Hudson, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 100,545, Dec. 21, 1970, abandoned, which is a continuation of Ser. No. 741,342, July 1, 1968, abandoned. This application Jan. 12, 1972, Ser. No. 217,121

Int. Cl. C08d *3/04, 1/14*

U.S. Cl. 260—94.2 R **1 Claim**

1. A rubbery, amorphous polymer of 2-ethyl-1,3-butadiene characterized by having a structure comprising at least about 98 percent of a trans-1,4-addition structure, having a melting point of from about 18°C. to about 25°C. measured by dilatometric analysis with mercury as the containing fluid and a heating rate of 5°C. to 10°C. per day, having an inherent viscosity of from about 6 to about 10 dl/g, and having an ultimate tensile strength of from about 500 to about 2000 pounds per square inch at an elongation of from about 400 to about 800 percent at about 25°C.

3,928,302
ALKALINE EARTH METAL ORGANOMETALLIC COMPOUNDS, THEIR PREPARATION BY METALLATION AND CATALYSTS COMPRISING SAME

Ivan Glen Hargis, Tallmadge, and Russell Anthony Livigni, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 69,476, Sept. 3, 1970. This application Feb. 1, 1973, Ser. No. 328,583

Int. Cl. C08f *1/00, 1/28, 3/00*

U.S. Cl. 260—94.3 **10 Claims**

1. The method which comprises polymerizing at a temperature of from about −90° to 100°C. a polymerizable monomer selected from the group consisting of methyl acrylate, ethyl acrylate, butyl acrylate, ethyl hexyl acrylate, octyl acrylate, methyl methacrylate, ethyl methacrylate, butyl methacrylate, methyl ethacrylate, ethyl ethacrylate, butyl ethacrylate, octyl ethacrylate, acrylonitrile, methacrylonitrile, butadiene, isoprene, dimethyl butadiene, styrene, metavinyl toluene and paravinyl toluene and mixtures of the same with at least one diorgano-metallic catalyst where the metal of said catalyst is selected from the group consisting of barium, strontium and calcium and mixtures thereof and where the organic moiety of said catalyst is selected from the group consisting of xanthene, 9-phenyl xanthene, 9-(alpha naphthyl)xanthen and 9-(2-methoxy phenyl)xanthene and mixtures thereof, said metal being joined to said organic moiety by an ionic carbon to metal bond.

3,928,303
PROCESS FOR PRODUCING BUTADIENE POLYMER

Seimei Yasui; Yasuo Shinohara, both of Ibaraki, and Yoshiharu Yagi, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 1, 1973, Ser. No. 336,917

Claims priority, application Japan, Mar. 1, 1972, 47-21847; Mar. 31, 1972, 47-32969

Int. Cl.² C08F *136/06, 4/40;* **B01J** *31/14*

U.S. Cl. 260—94.3 **15 Claims**

1. A process for the polymerization of butadiene to give a rubber-like solid which comprises contacting butadiene with a catalyst system consisting essentially of (A) an organic aluminum fluoride compound of the formula: $AlR_{3-n}F_n$ wherein R is alkyl, aryl or aralkyl and n is a real number larger than 1 and smaller than 2 and (B) an organic nickel compound selected from the group consisting of nickel salts of organic carboxylic acids, nickel salts of organic complex compounds, tetracarbonyl nickel and π-bonded organic nickel compounds, the molar ratio of the organic aluminum fluoride compound to the organic nickel compound being in a range of from 1:1 to 1000:1, to produce said rubber-like solid butadiene polymer having a high content of cis-1,4 structure.

3,928,304
METHOD OF MAKING POLYOLEFINS USING ORGANOTIN CHROMATE POLYMERIZATION CATALYST

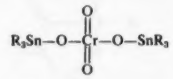
Thomas Pullukat, Hoffman Estates, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 414,177, Nov. 8, 1973, Pat. No. 3,876,554. This application Dec. 20, 1974, Ser. No. 534,874

Int. Cl.² C08F *4/44, 110/02, 210/02*

U.S. Cl. 260—94.9 D **8 Claims**

1. The method of making polymers from polymerizable 1-olefins which comprises polymerizing at least one of said olefins under polymerizing conditions with a catalyst system comprising an organotin chromate essentially of the formula:



and cocatalytic amounts of an alkyl aluminum compound of the formula R_aAlX_b, in each of which formula each R is a hydrocarbyl radical containing from 1 to about 14 carbon atoms and all R's are the same or different, X is a halogen or an alkoxy group, a is an integer from 1 to 3 inclusive, b is an integer from 0 to 2 inclusive, and the sum of a and b is 3.

3,928,305
UREA DERIVATIVES OF ACYL DERIVATIVES OF KTI

Eugen Werle; Hans Fritz, and Harald Schult, all of Munich, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 23, 1970, Ser. No. 92,314

Claims priority, application Germany, Dec. 19, 1969, 1963734

Int. Cl.² C07C *103/52;* **A61K** *37/26*

U.S. Cl. 260—112.5 **6 Claims**

1. Urea derivatives of acylated kallikrein-trypsin-inhibitor wherein the positions 26, 41, 46 and the amino group of the N-terminal arginine in position 1 are partially or completely acylated, and wherein the ϵ-amino group of the 15-lysine residue is replaced by a radical selected from the group consisting of urea and guanidine radicals.

3,928,306
PEPTIDES HAVING XENOPSIN-LIKE PHARMACOLOGICAL ACTIVITY

Mikio Uchiyama, Urawa; Shinro Tachibana, Narashino; Kengo Araki, Niiza, and Takafumi Nakamura, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

Filed Oct. 22, 1974, Ser. No. 517,107

Claims priority, application Japan, Oct. 23, 1973, 48-118550; Oct. 23, 1973, 48-118551

Int. Cl.² C07C *103/52;* **A61K** *37/00*

U.S. Cl. 260—112.5 R **3 Claims**

1. Peptide compounds represented by the general formula:
R—Arg—Pro—Trp—Ileu—Leu—OH
wherein R stands for H or the grouping of pyrGlu—Lys—Gly.

3,928,307
P-GLU-D-PHE-TRP-SER-TYR-D-PHEE-LEU-ARG-PRO-GLY-NH2 AND INTERMEDIATES

Theodore J. Foell, and John P. Yardley, both of King of Prussia, Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,382
Int. Cl.² C07C *103/52*; **A61K** *37/00*
U.S. Cl. 260—112.5 LH **8 Claims**

1. A compound selected from the group consisting of L-p-Glu-D-Phe-L-Trp-L-Ser-L-Tyr-D-Phe-L-Leu-L-Leu-L-Arg-L-Pro-Gly-NH_2 and R⁴-L-p-Glu-D-Phe-L-Trp-L-Ser(R^3)-L-Tyr(R^2)-D-Phe-L-Leu-L-Arg-(N^G-R^1)-L-Pro-Gly-R and its non-toxic salts; wherein

R is selected from the class consisting of NH_2, OH, O-(lower)alkyl and O-benzyl; R^1 is selected from the class consisting of hydrogen and a protecting group for the $N^δ$, $N^ω$ and $N^{ω'}$ nitrogen atoms of arginine selected from nitro, tosyl, benzyloxycarbonyl, and adamantyloxycarbonyl;

R^2 is selected from the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^3 is selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of serine and is selected from acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl, benzyl and benzyloxycarbonyl;

R^4 is selected from the class consisting of hydrogen and an α-amino protecting group, with the proviso that at least one of R^1, R^2 and R^3 is a protecting group.

3,928,308
P-GLU-D-P-F-PHE-TRP-SER-TYR-D-ALA-LEU-ARG-PRO-LY-NH_2

John P. Yardley, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,383
Int. Cl.² C07C *103/52*; **A61K** *37/00*
U.S. Cl. 260—112.5 LH **8 Claims**

1. A compound selected from the group consisting of L-p-Glu-D-p-F-Phe-L-Trp-L-Ser-L-Tyr-D-Ala-L-Leu-L-Arg-L-Pro-Gly-NH_2 and R⁴-L-p-Glu-D-p-F-Phe-L-Trp-L-Ser(R^3)-D-Ala-L-Leu-L-Arg-(N^G-R^1)-L-Pro-Gly-R and its non-toxic salts; wherein

R is selected from the class consisting of NH_2, OH, O-(lower)alkyl and O-benzyl; R^1 is selected from the class consisting of hydrogen and a protecting group for the $N^δ$, $N^ω$ and $N^{ω'}$ nitrogen atoms of arginine selected from nitro, tosyl, benzyloxycarbonyl and adamantyloxycarbonyl;

R^2 is selected from the class consisting of hydrogen and a protecting group for the phenolic hydroxyl group of tyrosine selected from tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, benzyloxycarbonyl and 4-bromobenzyloxycarbonyl;

R^3 is selected from the class consisting of hydrogen and a protecting group for the alcoholic hydroxyl group of serine and is selected from acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl, benzyl and benzyloxycarbonyl;

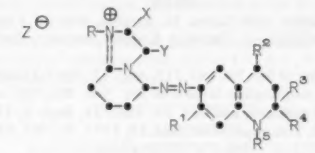
R^4 is selected from the class consisting of hydrogen and an α-amino protecting group, with the provisa that at least one of R^1, R^2 and R^3 is a protecting group.

3,928,309
CATIONIC DYES FROM 5-AMINOIMIDAZO-(1,2-A)-PYRIDINES

Gary T. Clark, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 15, 1974, Ser. No. 488,350
Int. Cl.² C09B *29/36*; **D06P** *3/24*, *3/52*
U.S. Cl. 260—146 R **10 Claims**

1. Basic cationic dye having the formula



wherein

R is lower alkyl or benzyl;

R^1 is hydrogen, lower alkyl, lower alkoxy, formamido, acetamido, or benzamido;

R^2, R^3 and R^4 are the same or different and each represents hydrogen or methyl with the proviso that when R^2 is methyl then R^3 and R^4 are methyl and when R^2 is hydrogen only one of R^3 and R^4 may be methyl;

R^5 is lower alkyl or lower alkyl substituted with chloro, hydroxy, acetoxy, methoxy, acetamido, cyano, succinimido or phthalimido;

X is hydrogen or lower alkyl;

Y is hydrogen, lower alkoxycarbonyl, lower alkyl or formyl; and

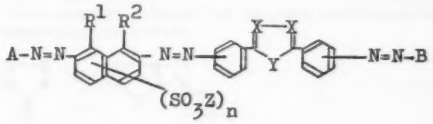
Z is a basic dye anion.

3,928,310
TRISAZO COMPOUNDS CONTAINING A DIPHENYLHETEROCYCLIC COMPONENT

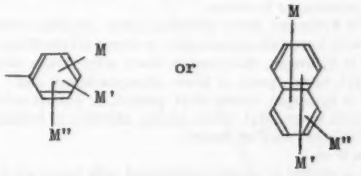
Kenzo Konishi, Nishinomiya; Akira Kotone, Nara; Yoshihiko Nakane, Yao; Takeshi Hori, and Masahiro Hoda, both of Sakai, all of Japan, assignors to Sakai-Chemical Industry Company, Ltd., Sakai, Japan

Filed Sept. 21, 1973, Ser. No. 399,555
Claims priority, application Japan, Sept. 22, 1972, 47-95707
Int. Cl.² C09B *35/36*, *35/46*; **D06P** *1/18*, *1/39*
U.S. Cl. 260—152 **13 Claims**

1. A polyazo dye represented by the formula:



wherein A is phenyl, naphthyl or phenyl or naphthyl substituted with chlorine, lower alkyl, lower alkoxy, amino, carboxy, nitro, SO_3H or SO_3Na; B is



where M is NH_2 or OH; M′ and M″ are the same or different and are H, NO_2, lower alkyl, SO_3H, SO_3Na or $N(R^6)_2$, the

members R^6 being independently H, NO_2, lower alkyl or phenyl substituted with lower alkyl; X is CH or N; Y is NH, N—NH_2, N—R^3, O or S, where R^3 is lower alkyl; Z is hydrogen, alkali metal, or NH_4; *n* is 1 or 2; and each of R^1 and R^2 is hydroxyl or amino, R^1 being amino when R^2 is hydroxyl or R^1 is hydroxyl when R^2 is amino.

3,928,311

NOVEL QUATERNIZED HETEROCYCLIC MONOAZO DYES

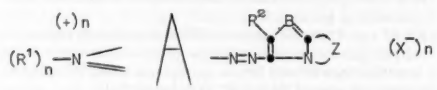
John G. Fisher, and James M. Straley, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 661,215, Aug. 17, 1967, abandoned, which is a continuation-in-part of Ser. Nos. 484,720, Sept. 2, 1965, abandoned, and Ser. No. 484,721, Sept. 2, 1965, abandoned. This application Mar. 15, 1973, Ser. No. 341,416

Int. Cl.² C09B *43/00*

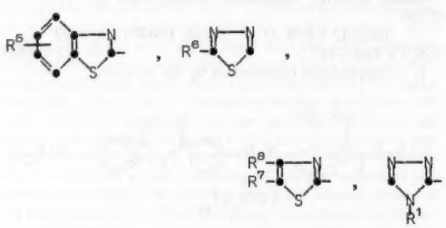
U.S. Cl. 260—156 **13 Claims**

1. A compound having the formula



wherein

is 4-cyano-3-pyrazolyl, 3-pyrazolyl, 4-nitro-3-pyrazolyl, 4-bromo-3-pyrazolyl, 4-ethoxycarbonyl-3-pyrazolyl, 3-isothiazolyl, 5-methylsulfonyl-3-isothiazolyl, 5-nitro-3-isothiazolyl, 4,5-dimethyl-3-isothiazolyl, 5-cyano-3-isothiazolyl, 2-pyridyl, 4-pyridyl, 2-benzimidazolyl, 6-methoxy-2-benzimidazolyl, 6-methylsulfonyl-2-benzimidazolyl or a group having the formula



wherein

R^5 is hydrogen, nitro, cyano, lower alkylsulfonyl, lower alkoxycarbonyl, thiocyanato, lower alkyl, lower alkoxy, chlorine, or bromine;

R^6 is hydrogen, lower alkylthio, lower alkylthio substituted with lower alkoxycarbonyl, or lower alkylsulfonyl;

R^7 is hydrogen, thiocyanato, lower alkyl, lower alkylsulfonyl, nitro, cyano, or lower alkoxycarbonyl; and

R^8 is hydrogen, lower alkyl, phenyl, or phenyl substituted with lower alkyl, lower alkoxy, chlorine or bromine;

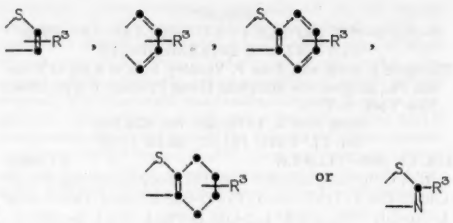
R^1 is lower alkyl or benzyl;

n is 0 or 1;

R^2 is phenyl or phenyl substituted with lower alkyl, lower alkoxy, chlorine, bromine, nitro, or cyano;

B is N;

Z is a group having the formula



wherein R^3 is hydrogen, lower alkyl, phenyl, or phenyl substituted with lower alkyl, lower alkoxy, chlorine or bromine; and X is an anion.

3,928,312

NOVEL P-SULFONAMIDOPHENOLS CAPABLE OF RELEASING A HETEROCYCLIC AZO DYE

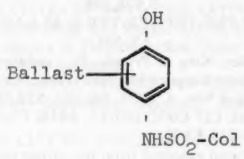
Lee J. Fleckenstein, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 282,795, Aug. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 176,752, Aug. 31, 1971, abandoned. This application Apr. 16, 1973, Ser. No. 351,700

Int. Cl.² C09B *29/36, 29/38*; G03C *5/30, 7/00*

U.S. Cl. 260—156 **5 Claims**

1. A compound having the formula:



wherein:

a. Col is a heterocylic azo dye moiety, and

b. Ballast is an organic ballasting radical containing at least 8 carbon atoms which renders said compound nondiffusible in a photographic element during development with an alkaline processing composition.

3,928,313

TRISAZO DYESTUFF

Sisto Sergio Papa, Milan, and Renzo Ferrario, Cerlano Laghetto (Milan), both of Italy, assignors to Aziende Colori Nazionali Affini ACNA S.p.A, Milan, Italy

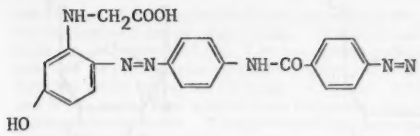
Filed Jan. 27, 1975, Ser. No. 544,175

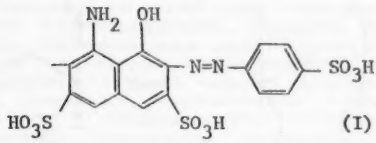
Claims priority, application Italy, Feb. 4, 1974, 20150/74

Int. Cl.² C09B *35/46*

U.S. Cl. 260—173 **1 Claim**

1. A trisazo dyestuff having the formula:





(I)

3,928,314
ONE STEP PROCESS OF PREPARING AZO DYES BY SIMULTANEOUS DIAZOTIZATION AND COUPLING AT LOW PH

Alain Claude Rochat, Birsfelden, Switzerland, and Emil Stocker, deceased, late of Riehen, Switzerland (by Heidi Stocker-Boller, legal representative), assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 92,882, Nov. 25, 1970, abandoned. This application May 18, 1973, Ser. No. 361,841

Claims priority, application Switzerland, Nov. 27, 1969, 17614/69

Int. Cl.² C09B *29/00, 41/00*

U.S. Cl. 260—203 **13 Claims**

1. Process for the production of a metal-free azo compound containing no sulphonic acid groups by diazotisation and coupling in organic solvents, which consists essentially of adding a C_1 to C_{10} alkyl nitrite at a temperature between −50°C and +100°C, to an anhydrous reaction mixture consisting of a diazotisable primary amino-benzene, a coupling component, a C_2 to C_8 α-halogenated alkanoic acid having a pK_a-value smaller than 3.0 in an amount of 0.05 to 0.5 moles of said acid relative to 1 mole of said amine, and an organic, non-water-soluble solvent having a dielectric constant smaller than 15, or a mixture of such solvents.

3,928,315
γ-MODIFICATION OF PHENYL-AZO-NAPHTHOL PIGMENT

Joachim Ribka, Offenbach am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

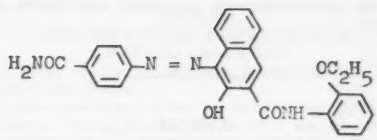
Continuation of Ser. No. 176,694, Aug. 31, 1971. This application Jan. 25, 1974, Ser. No. 436,793

Claims priority, application Germany, Sept. 2, 1970, 2043482The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.

Int. Cl.² C09B *67/00, 29/20*

U.S. Cl. 260—204 **1 Claim**

1. A monoazo pigment of the formula



in its new γ-modification, characterized by an X-ray diagram by means of Cu- Kα-radiation, which shows at glance angles of 3.7° and 12.8° maxima of high intensity, at 5.7°, 7.7° and 9.1° maxima of middle intensity and at 4.5°, 6.5°, 7.3°, 8.3° and 11.0° maxima of low intensity.

3,928,316
XANTHOMONAS GUM AMINE SALTS

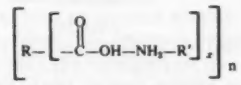
Wesley A. Jordan, Denver, Colo., and Walter H. Carter, Houston, Tex., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Apr. 22, 1974, Ser. No. 462,897

Int. Cl.² C08B *9/00*

U.S. Cl. 260—209 R **2 Claims**

1. A salt of xanthomonas gum and a fatty amine containing from 10 to 20 carbon atoms, said salt having the formula:



wherein R is the hexosic groups constituting the repeating monomer group in the xanthomonas gum polymer chain, R' is an alkyl group containing from 10 to 20 carbon atoms, *x* is the number of carboxylic-amine salt groups per repeating monomer group and is an integer of 3 to 4, *n* is a number between 300 and 1,000 and the degree of substitution of said carboxylicamine salt groups in the polymer is between 3 and 4.

3,928,317
ANTIBIOTIC BM408α

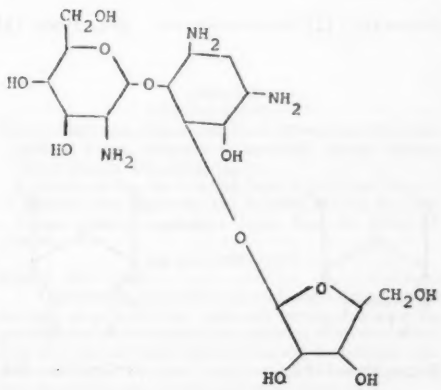
Jane Parsons Kirby, New City; Donald Bruce Borders, Suffern, and Jean Hayes Korshalla, Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 445,176

Int. Cl.² C07H *15/22*

U.S. Cl. 260—210 AB **5 Claims**

1. A compound selected from the group consisting of the compound of the formula:



and the pharmacologically acceptable acid-additon salts thereof.

3,928,318

PROCESS FOR MAKING METHYL GLUCOSIDE

Erwin Panusch, Livermore, and Igor Sobolev, Orinda, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 1, 1974, Ser. No. 520,180
Int. Cl.² C07H *15/04*
U.S. Cl. 260—210 R **6 Claims**

1. In the process of making methyl glucoside by the acid-catalyzed reaction of glucose and methanol the improvement which comprises incorporating in the reaction mixture of glucose, methanol and acid catalyst, anhydrous hydratable $CaSO_4$ in an amount sufficient to provide a $CaSO_4$:glucose weight ratio of at least 1:1, maintaining the reaction mixture within the temperature range of about 50°C and 200°C until formation of methyl glucoside ceases, cooling the reaction mixture, neutralizing the acid catalyst with a base capable of forming a salt of neutralization which is insoluble in the reaction mixture, and recovering methyl glucoside having a residual glucose content of less than about 1% by weight.

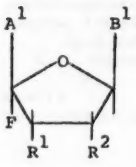
3,928,319

4'-FLUORO NUCLEOSIDES, NOVEL INTERMEDIATES AND METHODS OF PREPARING SAME

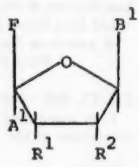
Ian Jenkins, Brighton, England; John G. Moffatt, and Julien P. H. Verheyden, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 153,817, June 16, 1971, Pat. No. 3,817,978. This application May 31, 1972, Ser. No. 258,327The portion of the term of this patent subsequent to June 18, 1991, has been disclaimed.
Int. Cl.² C07H *19/16, 19/20*
U.S. Cl. 260—211.5 R **37 Claims**

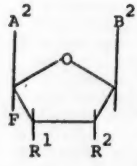
1. A compound selected from the group of compounds having the formulas:



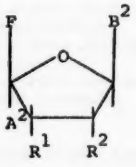
β-D-ribo (I)



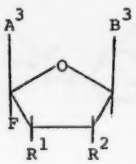
α-L-lyxo (I)



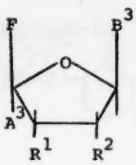
β-D-ribo (II)



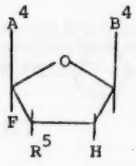
α-L-lyxo (II)



β-D-ribo (III)

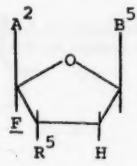


α-L-lyxo (III)



(XV)

and



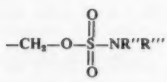
(XVI)

wherein R^1 and R^2 are independently hydroxy or acyloxy having from 2 through 12 carbon atoms, or R^1 and R^2 together form the group

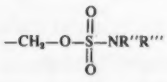
or

wherein R^3 and R^4 are independently hydrogen, lower alkyl, aryl having from 6 through 12 carbon atoms or together with the carbon atom to which they are joined form a cycloalkyl group having from 5 through 7 ring carbon atoms; A^1 is selected from the group having the formulas: $—CH_2OH$, $—CH_2N_3$, $—CH_2I$ or $—CH_2OPO(OH)_2$; and B^1 is a purine base selected from the group consisting of 6-mercaptopurine, 2-amino-6-lower alkylthiopurine, 6-lower alkylthiopurine, 2-amino-6-mercaptopurine, 6-dimethylaminopurine, 2-amino-6-methylaminopurine, 2-amino-6-dimethylaminopurine, 6-(1-adamantylamino)purine, 7-deazaadenine, hypoxanthine, xanthine, guanine, 8-azaguanine, 7-deazaguanine, adenine, 2-fluoroadenine, 2-chloroadenine, 2-azaadenine, 8-aza-9-deazaadenine, 7-deaza-7-cyanoadenine, and 8-azaadenine; or B^1 is a pyrimidine base selected from the group consisting of cytosine, 5-fluorocytosine, 5-chlorocytosine, 5-bromocytosine, 5-iodocytosine, 5-lower alkyl cytosine, 5-trifluoromethylcytosine, 5-hydroxymethylcytosine, 5-nitrocytosine, 5-azacytosine, 6-azacytosine, 5-methyl-6-azacytosine, 2-thiocytosine, uracil, 5-fluorouracil, 5-chlorouracil, 5-bromouracil, 5-iodouracil, 5-lower alkyluracil, 5-trifluoromethyluracil, 5-hydroxymethyluracil, 5-nitrouracil, 5-azauracil, 6-azauracil, 5-methyl-6-azauracil, 2-thiouracil, 4-thiouracil, 2,4-dithiouracil, 5-aminouracil, 5-methylaminouracil, 5-dimethylaminouracil, 5-methylaminocytosine, 5-dimethylaminocytosine, 5-aminocytosine, 4-hydroxylamino-5-fluoro-pyrimidin-2-one, 4-hydroxylamino-5-bromo-pyrimidin-2-one, 4-hydroxylamino-5-chloro-pyrimidin-2-one, 4-hydroxylamino-5-iodo-pyrimidin-2-one, 4-hydroxylamino-5-lower alkylpyrimidin-2-one, 4-hydroxylamino-5-trifluoromethylpyrimidin-2-one, 4-hydroxylamino-5-hydroxymethylpyrimi-

din-2-one, 4-hydroxylamino-5-nitro-pyrimidin-2-one, 4-hydroxylamino-5-aza-pyrimidin-2-one, 4-hydroxylamino-5-methyl-6-aza-pyrimidin-2-one, 4-hydroxylamino-pyrimidin-2-one, and 4-hydroxylamino-pyrimidin-2-thione; A^2 is selected from the group having the formulas: $-CH_3$ and $-CH_2NH_2$; and B^2 is a purine base selected from the group consisting of 6-dimethylaminopurine, 2-amino-6-methylaminopurine, 2-amino-6-dimethylaminopurine, 6-(1-adamantylamino)purine, 7-deazaadenine, hypoxanthine, xanthine, guanine, 8-azaguanine, 7-deazaguanine, adenine, 2-fluroadenine, 2-chloroadenine, 2-azaadenine, 8-aza-9-deazaadenine, 7-deaza-7-cyanoadenine, and 8-azaadenine; or B^2 is a pyrimidine base selected from the group consisting of cytosine, 5-fluorocytosine, 5-chlorocytosine, 5-lower alkyl cytosine, 5-trifluoromethylcytosine, 5-hydroxymethylcytosine, 5-azacytosine, 6-azacytosine, 5-methyl-6-azacytosine, uracil, 5-flurouracil, 5-chlorouracil, 5-lower alkyluracil, 5-trifluoromethyluracil, 5-hydroxymethyluracil, 5-azauracil, 6-azauracil, 5-methyl-6-azauracil, 5-aminouracil, 5-methylaminouracil, 5-dimethylaminouracil, 5-methylaminocytosine, 5-dimethylaminocytosine, 5-aminocytosine, 4-hydroxylamino-5-fluoro-pyrimidin-2-one, 4-hydroxylamino-5-chloro-pyrimidin-2-one, 4-hydroxylamino-5-lower alkyl pyrimidin-2-one, 4-hydroxylamino-5-hydroxymethylpyrimidin-2-one, 4-hydroxylamino-5-aza-pyrimidin-2-one, 4-hydroxylamino-6-aza-pyrimidin-2-one, 4-hydroxylamino-5-methyl-6-aza-pyrimidin-2-one, 4-hydroxylamino-5-trifluoromethylpyrimidin-2-one, and 4-hydroxylamino-pyrimidin-2-one; A^3 is selected from the group having the formula



wherein R'' and R''' are independently hydrogen or lower alkyl having from 1 through 6 carbon atoms; and B^3 is a purine base selected from the group consisting of 6-mercaptopurine, 2-amino-6-lower alkylthiopurine, 6-lower alkylthiopurine, 2-amino-6-mercaptopurine, 6-dimethylaminopurine, 2-amino-6-methylaminopurine, 2-amino-6-dimethylaminopurine, 6-(1-adamantylamino)purine, 7-deazaadenine, xanthine, guanine, 8-azaguanine, 7-deazaguanine, 2-fluoroadenine, 2-chloroadenine, 2-azaadenine, 8-aza-9-deazaadenine, 7-deaza-7-cyanoadenine, and 8-azaadenine; or B^3 is a pyrimidine base selected from the same group of pyrimidine bases as B^1; wherein A^4 is $-CH_2OH$, $-CH_2I$, $-CH_2N_3$, $-CH_2OPO(OH)_2$ or



wherein R'' and R''' are as defined above; B^4 is a pyrimidine base selected from the group consisting of cytosine, 5-fluorocytosine, 5-chlorocytosine, 5-bromocytosine, 5-iodocytosine, uracil, 5-fluorouracil, 5-chlorouracil, 5-bromouracil, 5-iodouracil, 5-lower alkyl uracil; and R^5 is hydroxy or an acyloxy group having from 2 through 12 carbon atoms; and B^5 is a pyrimidine base selected from the group consisting of cytosine, 5-fluorocytosine, 5-chlorocytosine, uracil, 5-fluorouracil, 5-chlorouracil, and 5-lower alkyl uracil; and pharmaceutically acceptable salts of the compounds of formulas, I, II and III.

3,928,320
PROCESS FOR THE PREPARATION OF METHYLCOBALAMINE

Jean Boige, 53, rue Vercingetorix, Aulnay-sous-Bois, Seine-Saint-Denis, France

Continuation-in-part of Ser. No. 303,147, Nov. 2, 1972, abandoned. This application July 26, 1974, Ser. No. 492,975

Claims priority, application France, Nov. 10, 1971, 71.40233; Aug. 8, 1973, 73.28998; Dec. 28, 1973, 73.46829

Int. Cl.² C07H 23/00

U.S. Cl. 260—211.7 **12 Claims**

1. In a process for the preparation of methylcobalamine from hydroxocobalamine, the improvement consisting essentially of dissolving hydroxocobalamine in a solution of methanol containing 5 to 20 percent of water by volume, adding to said solution monomethyloxalate and a cobalt salt selected from the group consisting of cobalt chloride, cobalt nitrate and cobalt oxalate and adding to the obtained solution zinc powder in order that simultaneous reduction and methylation of hydroxocobalamine occur.

3,928,321
PREPARATION OF STARCH ESTERS

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

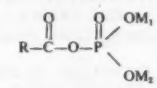
Filed May 6, 1974, Ser. No. 467,109

Int. Cl.² C08B 31/02

U.S. Cl. 260—233.5 **8 Claims**

1. A method for the preparation of starch esters comprising:

a. reacting a starch base in an aqueous medium at a temperature of from 10° to 90°C. and a pH of from about 5.0 to 12.5 with an acyl phosphate corresponding to the formula:



wherein R contains from 1 to 10 carbon atoms and is selected from the group consisting of alkyl, substituted alkyl, alkenyl, substituted alkenyl, cycloalkyl, bicycloalkyl, substituted bicycloalkyl, unsaturated bicycloalkyl, substituted unsaturated bicycloalkyl, aryl, substituted aryl, and aryl-alkyl; and M_1 and M_2 are cations, and

b. isolating the resultant starch derivative.

3,928,322
KONJAC MANNAN

Noboru Sugiyama, Tokyo, and Hideo Shimahara, Hiroshima, both of Japan, assignors to Kabushiki Kaisha Shimizu Manzo Shoten, Hiroshima, Japan

Division of Ser. No. 179,201, Sept. 9, 1971, Pat. No. 3,856,945. This application Oct. 9, 1974, Ser. No. 513,298

Claims priority, application Japan, Dec. 30, 1970, 45-128288

Int. Cl.² C08B 37/00

U.S. Cl. 260—236.5 **2 Claims**

1. A process for preparing a purified, water-soluble konjac mannan, characterized by vigorously stirring with water the ground tuber of the konjac plant, removing insoluble material from the resultant liquid mixture, dialyzing the resultant solution with water to remove therefrom soluble impurities, and then lyophilizing the solution to remove water.

3,928,323
ANTI-MICROBIAL QUATERNARY AMMONIUM CO-POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application Oct. 3, 1974, Ser. No. 511,759
Int. Cl.² C07D *295/12*
U.S. Cl. 260—239 B 4 Claims

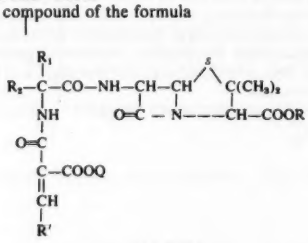
1. A product formed by the condensation of a mixture of difunctional tertiary amines and a molar quantity of 1,4-dichloro-2-butene that is substantially equal to the molar sum of the mixture of the difunctional tertiary amines, said mixture of difunctional tertiary amines being selected from the group consisting of (a) 1,4-bis-(dimethylamino)-2-butene and N,N′-di-lower alkyl piperazine, (b) 1,4-diazabicyclo (2.2.2) octane and 1,4-di-(N-homo-piperidino)-2-butene, (c) 1,4-bis-(dimethylamino)-2-butene and 1,4-bis-(N-homo piperidino)-2-butene, (d) 1,4-bis-(dimethylamino)-2-butene, 1,4-bis-(N-homopiperidino)-2-butene and N,N′-di-lower alkyl piperazine, (e) 1,4-bis-(dimethylamino)-2-butene, N,N′-di-lower alkyl piperazine and 1,4-diazabicyclo (2.2.2) octane, and (f) 1,4-bis-(dimethylamino)-2-butene and 1,4-diazabicyclo (2.2.2) octane.

3,928,324
MALONYL DERIVATIVES OF 6-(α-AMINOACYLAMIDO)PENICILLANIC ACIDS

Robert L. Rosati, Stonington, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 8, 1973, Ser. No. 330,751
Int. Cl.² C07D *499/44*
U.S. Cl. 260—239.1 3 Claims

1. A compound of the formula



wherein R is selected from the group consisting of hydroen and acyloxy lower alkyl wherein acyloxy is selected from the group consisting of lower alkanoyloxy, benzoyloxy and substituted benzoyloxy wherein the substituent is selected from the group consisting of chloro, bromo, fluoro, lower alkyl, lower alkoxy and trifluoromethyl, cations selected from the group consisting of sodium, potassium, calcium, magnesium and ammonium; and amines selected from the group consisting of procaine, N,N′-dibenzylethylenediamine, N-ethylpiperidine, dibenzylamine, N,N-bis(dehydroabietyl)ethylenediamine, 1-ephenamine, triethylamine and benzhydrylamine;

R_1 is selected from the group consisting of hydrogen, alkyl of from 1 to 14 carbon atoms, cycloalkyl of from 3 to 6 carbon atoms, 1,4-cyclohexadienyl, cyclohepatrienyl, naphthyl, benzyl, phenethyl, indolylmethyl, furyl, thienyl, ω-ethylthio(lower)alkyl and

wherein Y is selected from the group consisting of hydrogen, nitro, di(lower alkyl) amino, lower alkanoylamino, lower alkyl, lower alkoxy, hydroxy, sulfamyl, chloro, bromo, fluoro, iodo and trifluoromethyl;

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_1 and R_2 when taken together with the carbon atom to which they are attached are cycloalkylidene of 3 to 10 carbon atoms;

R′ is a member selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms and cycloalkyl having from 3 to 6 carbon atoms; and

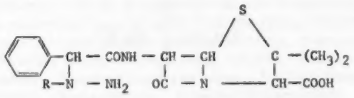
Q is a member selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, naphthyl, quinolyl, pphenyl, biphenyl, indanyl, 2-(1,4-naphthoquinonyl); cations selected from the grooup consisting of sodium, potassium, calcium, magnesium and ammonium; and amines selected from the group consisting of procaine, N,N′-dibenzylethylenediamine, N-ethylpiperidine, dibenzylamine, N,N-bis(dehydroabietyl)ethylenediamine, 1-ephenamine, triethylamine and benzhydrylamine.

3,928,325
ALPHA-HYDRAZINOBENZYLPENICILLINS

Giorgio Pifferi, Milan, Italy, assignor to I.S.F. S.p.A., Milan, Italy

Filed Nov. 5, 1973, Ser. No. 412,535
Claims priority, application Italy, Nov. 10, 1972, 31558/72; May 15, 1973, 24127/72
Int. Cl.² C07D *499/44*
U.S. Cl. 260—239.1 11 Claims

1. α-Hydrazinobenzylpenicillins of the formula:



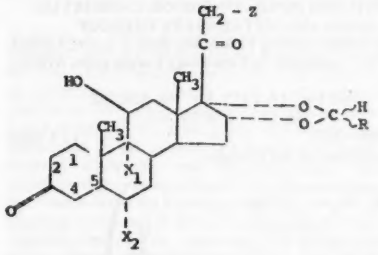
wherein R is hydrogen or an alkyl group having from 1 to 6 carbon atoms, in the form of either racemates or enantiomers; non-toxic salts thereof with an alkali or alkaline-earth metal cation, ammonium ion, or the cation of a non-toxic pharmaceutically acceptable amine; and non-toxic acid addition salts thereof with an inorganic acid selected from the group consisting of hydrochloric, hydrobromic, hydroiodic, sulfuric and phosphoric acids; or an organic acid selected from the group consisting of acetic, succinic, maleic, citric, benzoic, tartaric and ascorbic acids.

3,928,326
PROCESS FOR THE SEPARATION OF STEREOISOMERIC MIXTURES INTO THEIR COMPONENTS AND COMPONENTS OBTAINED HEREBY

Ralph Lennart Brattsand; Bo Thuresson af Ekenstam, both of Molndal; Karl Goran Claeson, Goteborg, and Bror Arne Thalen, Molndal, all of Sweden, assignors to AB Bofors, Bofors, Sweden

Filed May 14, 1973, Ser. No. 359,913
Int. Cl.² C07J *17/00*
U.S. Cl. 260—239.55 D **23 Claims**

8. Stereoisomeric component B of a stereoisomeric mixture (isomeric pair) of a steroid having the general formula:



(I)

wherein the 1,2-position is saturated or a double bond is present in that position, a double bond always being present in at least the 4,5-position, X_1 and X_2 are independently selected from hydrogen and fluorine, X_1 being selected from hydrogen and fluorine when X_2 is hydrogen and X_1 being fluorine when X_2 is fluorine, Z is selected from hydroxyl and esterified hydroxyl wherein the hydroxyl group is esterified with a member of the group consisting of phosphoric and sulphuric acids, dicarboxylic acids having 2–12 carbon atoms, pyridine-3-carboxylic acid, pyridine-4-carboxylic acid, benzofurane-2-carboxylic acid, and menthoxy-methylcarboxylic acid, and lower alkanoic acids, and R is selected from alkyl groups with straight or branched hydrocarbon chains, having 1–10 carbon atoms, said component B being the isomer of the isomer pair showing the greatest relative rotary power or having the greatest retention volume in gel filtration using a cross-linked dextran gel.

3,928,327
AROYL ALKYLEDENE THIAZOLINES

Akira Takamizawa, Ibaraki, and Hiroshi Harada, Toyonaka, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed Sept. 24, 1974, Ser. No. 509,354
Claims priority, application Japan, Dec. 14, 1973, 48-140766
Int. Cl.² C07D *239/04, 277/10, 417/04*
U.S. Cl. 260—240 J **27 Claims**

1. A compound represented by the general formula:

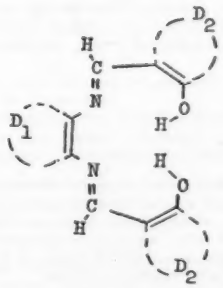
wherein R_1 represents a member selected from the group consisting of lower alkyl groups of up to 5 carbon atoms, lower alkenyl groups of up to 5 carbon atoms, lower alkynyl groups of up to 5 carbon atoms, aralkyl groups of 7 – 9 carbon atoms and (4-amino-2-methyl-5-pyrimidinyl)methyl group; R_2 represents a member selected from the group consisting of hydrogen atom and lower alkyl groups of up to 5 carbon atoms; R_3 represents a member selected from the group consisting of hydrogen atom and phenyl group; R_4 represents a member selected from the group consisting of unsubstituted aryl groups of 6 – 10 carbon atoms and substituted aryl groups of 6 – 10 carbon atoms.

3,928,328
SCHIFF BASE AND METAL BISAZOMETHINE METAL CHELATE

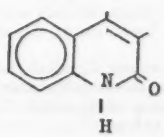
Pritam Singh Dhaliwal, Edison, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Division of Ser. No. 313,359, Dec. 8, 1972. This application Dec. 20, 1974, Ser. No. 535,140
Int. Cl.² C07D *215/20;* **C07C** *199/10*
U.S. Cl. 260—240 G **3 Claims**

1. A Schiff base of structural formula:



wherein D_1 represents the atoms necessary to complete a phenanthrene nucleus having the indicated nitrogen atoms attached to the 9,10-positions and D_2 represents the atoms necessary to complete a nucleus of the formula:



3,928,329
BIS-V-TRIAZOLYL-STILBENES

Fritz Fleck, Bottmingen; Horst Schmid, Munchenstein, both of Switzerland; Alec Victor Mercer, Leeds, and Roger Paver, Eldwick, both of England, assignors to Sandoz Ltd., Basel, Switzerland

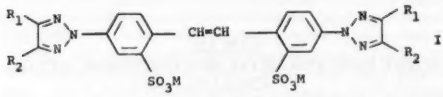
Filed May 13, 1974, Ser. No. 469,105

Claims priority, application Switzerland, May 17, 1973, 7045/73

Int. Cl.² C07D *401/14, 413/14*

U.S. Cl. 260—240.1 **38 Claims**

1. A compound of formula I,

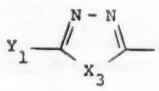


I

wherein

the R_1's are the same and each is hydrogen; chloro; C_{1-4} alkyl; phenyl; phenyl substituted by up to two substituents selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, fluoro, or chloro; or biphenyl,

the R_2's are the same and each is a radical of formula (a), (b), or (c),

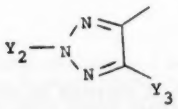


(a)

wherein

Y_1 is C_{1-4} alkyl; phenyl; or phenyl substituted by up to two substituents selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, fluoro, chloro or $-SO_3M$, and

X_3 is -O- or $-NY_5$-, where Y_5 is hydrogen; C_{1-4} alkyl; C_{1-4} alkyl monosubstituted by chloro; or C_{2-4} alkyl monosubstituted by hydroxy or $-SO_3M$,



(b)

wherein

Y_2 is naphthyl, unsubstituted or monosubstituted by C_{1-4} alkyl, C_{1-4} alkoxy or $-SO_3M$; phenyl; or phenyl substituted by up to two substituents selected from the group consisting of fluoro, chloro, C_{1-4} alkyl, C_{1-4} alkoxy or $-SO_3M$, and

Y_3 is hydrogen; chloro; C_{1-4} alkyl; phenyl; or phenyl substituted by up to two substituents selected from the group consisting of C_{1-4} alkyl, C_{1-4} alkoxy, fluoro, chloro or $-SO_3M$, and

(c)

wherein Y_4 is hydrogen or C_{1-4} alkyl, and M is hydrogen or a non-chromophoric cation, with the proviso that any substituted phenyl is substituted by no more than one $-SO_3M$ substituent.

3,928,330
SUBSTITUTED PIPERAZINEDIONE CARBOXYLIC ACIDS AND METAL SALTS THEREOF

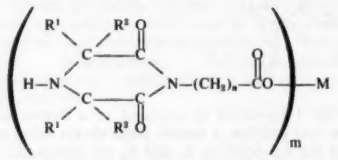
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 19, 1973, Ser. No. 426,425

Int. Cl.² C07D *295/10*

U.S. Cl. 260—242 **12 Claims**

1. A compound of the formula



I

wherein

R^1 and R^2 are independently of each other methyl or ethyl or together with the carbon to which they are bound form a cyclopentyl or cyclohexyl ring, which is unsubstituted or substituted with a methyl group;

n is an integer of from 1 to 12;

M is hydrogen, or a metal selected from the group consisting of barium, nickel, manganese, calcium, zinc, iron, sodium, cobalt, and tin; and

m has a value of from 1 to 4, the value of *m* being the same as the available valence of M.

3,928,331
PROCESS FOR THE MANUFACTURE OF 7-AMINO-3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES

Eberhard Bauerschmidt, Konigstein, Taunus; Dieter Bormann, Kelkheim, Taunus, and Manfred Worm, Mainz-Kastel, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

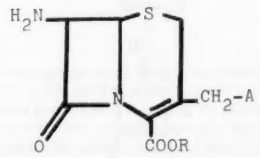
Filed Aug. 30, 1973, Ser. No. 392,877

Claims priority, application Germany, Sept. 2, 1972, 2243242

Int. Cl.² C07D *501/18*

U.S. Cl. 260—243 C **4 Claims**

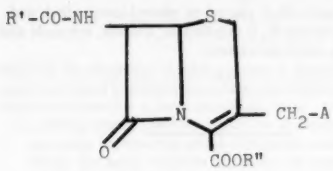
1. In a method for making a 7-amino-3-cephem-4-carboxylic acid or an ester thereof of the formula I



I

in which A stands for hydrogen, alkyl, acyloxy, alkyloxy or hydroxy and R stands of hydrogen, linear or branched alkyl, alkyl substituted by halogen, cycloalkyl, aryl, aralkyl, aralkyl

substituted by lower alkoxy or nitro, aryloxyalkyl, alkoxyalkyl, acyloxyalkyl, aroylalkyl or thienyl, and the salts thereof, from an acylamino compound of a formula II



II

in which R′ stands for alkyl, alkyl substituted by amino or carboxyl, aryl, aryl substituted by halogen or lower alkoxy or hydroxy, aralkyl, aralkyl substituted in the aromate by halogen or lower alkoxy or hydroxy, aralkyl substituted in the alkyl portion by lower alkyl or amino or halogen or lower alkoxy or lower acyloxy or the azido group, aryloxy alkyl, aryloxyalkyl substituted in the aromate by halogen or lower alkoxy or hydroxy, alkoxyalkyl and thienyloxymethyl, thienylmethyl, pyridylmethyl or isoxalyl and R″ has the meaning given for R but cannot stand for hydrogen and A is defined as above, by reacting compound II with an acid halide to form the corresponding iminohalide, converting the iminohalide into the corresponding iminoether by reaction with an alcohol, and hydrolyzing the resulting iminoether, the improvement wherein the compound of the formula II is reacted in an inert solvent with a silylating agent wherein the silylation agent used is trimethyl chlorosilane, dimethyl dichlorosilane, methyltrichlorosilane, triethyl chlorosilane, trimethyl bromosilane, N,O-bistrimethyl silyl acetamide or trimethylsilyl trifluoroacetamide in the presence of a base to activate the amido group before its reaction with the acid halide.

3,928,332

PROCESS FOR THE PRODUCTION OF 4-[3-[10-(2-TRIFLUOROMETHYL) PHENOTHIAZINYL]-PROPYL]-1-PIPERAZINEETHANOL, 1-ADMANTANE CARBOXYLIC ACID ESTER

Harry Louis Yale, New Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 22, 1974, Ser. No. 462,821
Int. Cl.² C07D *279/28*
U.S. Cl. 260—243 A **9 Claims**

1. A process for the production of crystalline 4-[3-[10-(2-trifluoromethyl)phenothiazinyl]propyl]-1-piperazineethanol, 1-adamantane carboxylic acid ester, which comprises reacting 4-[3-[10-(2-trifluoromethyl)phenothiazinyl]propyl]-1-piperazineethanol with about 1:0.9 to 1.3 equivalents of a 1-adamantoyl halide at a temperature within the range of about 60° to 150°C. for about 2 to 10 hours in the presence of an organic tertiary amine acid acceptor in an anhydrous aromatic hydrocarbon solvent in which the two reactants and acid acceptor are soluble but in which the amine halide by product is insoluble and separating 4-[3-[10-(2-trifluoromethyl)-phenothiazinyl]propyl]-1-piperazineethanol, 1-adamantane carboxylic acid ester from the reaction medium.

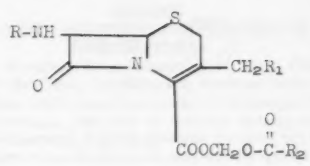
3,928,333

PROCESS FOR THE PREPARATION OF 3 CEPHALOSPORIN ESTERS

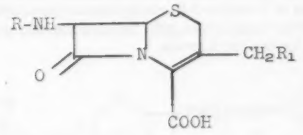
William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 20, 1974, Ser. No. 471,527
Int. Cl.² C07D *501/02*
U.S. Cl. 260—243 C **5 Claims**

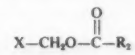
1. In a process for preparing a cephalosporin ester of the formula



which comprises reacting a Δ^3 cephalosporin acid of the formula



with a halomethyl ester of a lower alkanoic acid of the formula



in the presence of base in an inert solvent at a temperature below 50°C. and recovering the product, the improvement which comprises adding one equivalent of base to an equimolar mixture of the acid and the halomethyl ester at a rate such that the rate of generation of acid anion is approximately equivalent to the rate of esterification;

wherein R

is acetyl, mandeloyl, 0-formylmandeloyl, 2-phenoxyacetyl, 2-phenylacetyl, N-t-BOC-phenylglycyl, 2-(2-thienyl)acetyl or 2-(1,2,3,4-tetrazol-1-yl)acetyl;

R_1 is hydrogen, acetoxy, methylthio, (2-methyl-1,3,4-thiadiazol-5-yl)thio or (1-methyl-1,2,3,4-tetrazol-5-yl)thio;

R_2 is methyl, ethyl, isopropyl or tert-butyl; and

X is chloro, bromo or iodo;

subject to the limitations that when R is N-t-BOC-phenylglycyl, R_1 is other than acetoxy, (2-methyl-1,3,4-thiadiazol-5-yl)thio or (1-methyl-1,2,3,4-tetrazol-5-yl)thio.

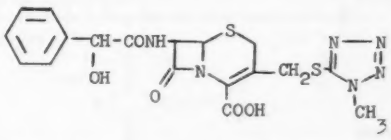
3,928,334

PROCESS FOR THE PRODUCTION OF CEFAMANDOLE

John Michael Essery, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

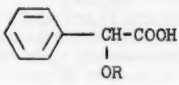
Filed June 6, 1974, Ser. No. 476,972
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C **1 Claim**

1. The process for the preparation of the compound cefamandole having the D-configuration in the sidechain and the formula



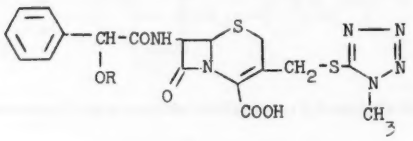
which comprises the consecutive steps of

a. mixing substantially equimolar weights of N-ethoxycarbonyl-2-ethoxy-1,2-dihydroquinoline and of a derivative of D-mandelic acid having the formula



wherein the hydroxyl blocking group R represents dichloroacetyl or formyl in anhydrous tetrahydrofuran at room temperature or below for a short period of time;

b. adding slowly thereto a solution at about the same temperature in aqueous tetrahydrofuran containing substantially the same number of moles of triethylamine as a tertiary amine and substantially the same number of moles of 7-amino-3-(1-methyltetrazol-5-yl)thiomethyl-3-cephem-4-carboxylic acid to produce the intermediate acid having the formula



thereof wherein R has the meaning set out above; and

c. removing said hydroxyl blocking group R by reaction with aqueous sodium bicarbonate to produce said cefamandole.

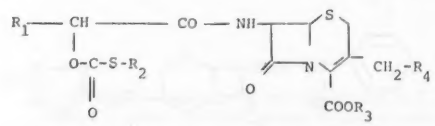
3,928,335

[[(ALKYLTHIOC ARBONYL)OXY]ACETYL]CEPHALOSPORINS

Uwe Treuner, and Hermann Breuer, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 8, 1974, Ser. No. 486,543
Int. Cl.² C07D *501/24*
U.S. Cl. 260—243 C **10 Claims**

1. A compound of the formula

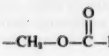


wherein

R_1 is hydrogen, lower alkyl, phenyl, thienyl, furyl or pyridyl;

R_2 is lower alkyl or phenyl-lower alkyl;

R_3 is hydrogen, lower alkyl, phenyl-lower alkyl, tri(lower alkyl)silyl, tri(lower alkyl)stannyl, alkali metal, alkaline earth metal, (lower alkyl)amine or



wherein R is lower alkyl, phenyl or phenyl-lower alkyl; and

R_4 is $-SR_5$ wherein R_5 is thiadiazole, triazole, tetrazole and their lower alkyl derivatives.

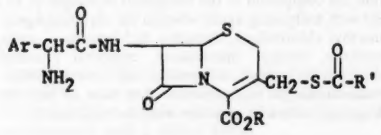
3,928,336

7-[D-(α-AMINOα-PHENYL-, 2-THIENYL- AND 3-THIENYL-ACETAMIDO)]-3-(3-METHYL-1,2,5-OXADIAZOL-4-YL)CARBONYLTHIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACIDS

John Michael Essery, and Lee Cannon Cheney, both of Fayetteville, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed July 29, 1974, Ser. No. 492,636
Int. Cl.² C07D *501/36*
U.S. Cl. 260—243 C **35 Claims**

1. A compound having the D-configuration in the 7-sidechain and the formula



wherein Ar is phenyl, 2-thienyl or 3-thienyl; R is hydrogen, pivaloyloxymethyl, acetoxymethyl, methoxymethyl, acetonyl or phenacyl; and R′ is 3-methyl-1,2,5-oxadiazol-4-yl; or a pharmaceutically acceptable salt thereof.

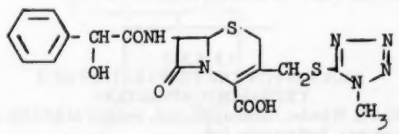
3,928,337

PROCESS FOR THE PRODUCTION OF CEFAMANDOLE

John Michael Essery, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.

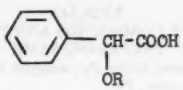
Filed Aug. 7, 1974, Ser. No. 495,343
Int. Cl.² C07D *501/22*
U.S. Cl. 260—243 C **1 Claim**

1. The process for the preparation of the compound cefamandole having the D-configuration in the sidechain and the formula



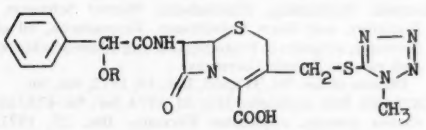
which comprises the consecutive steps of

a. mixing substantially equimolar weights of phosphonitrilic chloride trimer and of a derivative of D-mandelic acid having the formula



wherein the hydroxyl blocking group R represents dichloroacetyl or formyl in anhydrous tetrahydrofuran at room temperature or below for a short period of time;

b. adding slowly thereto a solution at about the same temperature in aqueous tetrahydrofuran containing substantially the same number of moles of triethylamine as a tertiary amine and substantially the same number of moles of 7-amino-3-(1-methyltetrazol-5-yl)thiomethyl-3-cephem-4-carboxylic acid to produce the intermediate acid having the formula



thereof wherein R has the meaning set out above; and

c. removing said hydroxyl blocking group R by reaction with aqueous sodium bicarbonate to produce said cefamandole.

3,928,338

SUBSTITUTED SULFONYLACETAMIDO CEPHALOSPORINS

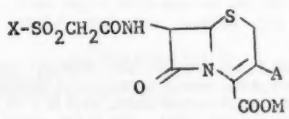
Robert M. De Marinis, King of Prussia, and John R. E. Hoover, Glenside, both of Pa., assignors to SmithKline Corporation, Philadelphia, Pa.

Division of Ser. No. 249,858, May 3, 1972, Pat. No. 3,865,819. This application Dec. 3, 1974, Ser. No. 529,163

Int. Cl.[2] C07D *501/22, 501/24, 501/28;* **A61K** *31/545*

U.S. Cl. 260—243 C **8 Claims**

1. A compound of the structure:



where:

X is NH_2; or mono or dialkylamino, each alkyl from C_1-C_4;

A is hydrogen, methyl, acetoxymethyl, or pyridiniummethyl; and

M is hydrogen, alkali metal cation, nontoxic ammonium cation, or when A is pyridiniummethyl an anionic charge.

3,928,339

BASIC OXAZINE DYESTUFFS AND PROCESS FOR THEIR PREPARATION

Eberhard Mundlos, Heusenstamm; Luis Herz, Offenbach, Main; Rudolf Neeb, Obertshausen; Reinhard Mohr, Offenbach, Main, and Johann Ostermeier, Diedenbergen, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

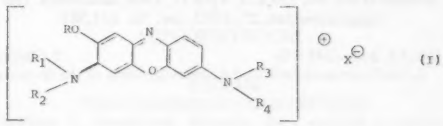
Division of Ser. No. 212,618, Dec. 27, 1971, Pat. No. 3,806,504. This application Jan. 21, 1974, Ser. No. 435,277

Claims priority, application Germany, Dec. 31, 1970, 2064735The portion of the term of this patent subsequent to Apr. 23, 1991, has been disclaimed.

Int. Cl.[2] C09B *19/00*

U.S. Cl. 260—244 R **3 Claims**

1. A basic oxazine dyestuff of the formula



(I)

in which R is lower alkyl or lower alkyl substituted by halogen, hydroxy, lower alkoxy or cyano, R_1 and R_2 each are hydrogen, lower alkyl, or lower alkyl substituted by halogen, hydroxy, lower alkoxy or cyano, R_3 is hydrogen, lower alkyl or lower alkyl substituted by halogen, hydroxy, lower alkoxy, cyano, carbamoyl, di-lower alkylamino or carbo-lower alkoxy, R_4 is hydrogen, lower alkyl or lower alkyl substituted by halogen, hydroxy, lower alkoxy, cyano, carbamoyl, di-lower alkylamino or carbo-lower alkoxy, or R_3 and R_4 taken together with nitrogen are a heterocyclic ring selected from the group consisting of morpholino or piperidino, and $X^{(-)}$ is an anion.

3,928,340

N-[(SUBSTITUTED AMINO) THIO]-IMIDES

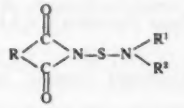
John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 266,008, June 26, 1972, Pat. No. 3,838,114. This application Mar. 7, 1974, Ser. No. 448,856

Int. Cl.[2] C07D *209/48, 401/12, 403/12, 413/12*

U.S. Cl. 260—247.1 L **2 Claims**

1. An imide having the following structural formula



wherein R is selected from the group consisting of 4,5-cyclohexenylene, orthophenylene, ethylene and 1,3-propylene, and

is selected from the group consisting of morpholino, 2,6-dimethylmorpholino, piperidino, diethylamino, diisopropylamino, 3-methylpiperidino, t-butylamino, dicyclohexylamino, N-β-cyanoethylcyclohexylamino, N-β-cyanoethyl-t-butylamino, N-β-cyanoethyl-n-butylamino, N-phenylcyclohexylamino, N-methylanilino, N-ethylanilino, N-ethylbenzylamino, dibenzylamino, N-phenylbenzylamino, N-cyanomethylcyclohexylamino and N-cyanomethyl-n-butylamino.

3,928,341

N-AMINOALKYL-4-ANILINO PYRIDINES

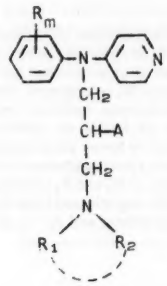
Jean-Louis Delarue, and Albert Debarge, both of Paris, France, assignors to Merrell Toraude, Paris, France

Division of Ser. No. 720,474, April 11, 1968, abandoned. This application Jan. 27, 1972, Ser. No. 221,382

Int. Cl.² C07D *295/12*

U.S. Cl. 260—247.5 G **7 Claims**

1. An N-amino-substituted 4-anilinopyridine of the formula



wherein

R is selected from the group consisting of hydrogen, chlorine, trifluoromethyl, methyl and ethyl;

m is the integer 1 or 2;

A is hydrogen or methyl;

R_1 is alkyl having 1 to 4 carbon atoms;

R_2 is alkyl having 1 to 4 carbon atoms the same as or different from R_1, tetrahydrofurfuryl, or R_1 and R_2 together with the nitrogen atom to which they are attached form morpholino, 2,6-dimethylmorpholino, piperidino, pyrrolidino or piperazino;

or the non toxic acid addition salts thereof.

3,928,342

NITROFURYL-TRIAZOLO(4,3-B)PYRIDAZINE COMPOUNDS AND BACTERIOSTATIC COMPOSITIONS

Herbert Berger, Mannheim-Kafertal; Rudi Gall, Gross-Sachen; Max Thiel; Wolfgang Vömel, both of Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Dec. 18, 1972, Ser. No. 316,197

Claims priority, application Germany, Jan. 21, 1972, 2202745

Int. Cl.² C07D *295/04, 237/00*

U.S. Cl. 260—247.5 EP **1 Claim**

1. 3-(5-nitro-2-furyl)-s-triazolo[4,3-b]pyridazine-6-carboximic acid morpholide.

3,928,343

ISOCYANURATE COMPOUNDS AND PROCESSES FOR PREPARING SAME

William J. Kauffman, Lititz, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Dec. 31, 1974, Ser. No. 537,687

Int. Cl.² C07D *263/34*

U.S. Cl. 260—248 NS **4 Claims**

1. 1,3-bis(2-cyanoethyl)-5-phenylisocyanurate.

3,928,344

PHENYLENEDIAMINE-S-TRIAZINES

Hermann Westlinning, Kleinostheim; Werner Schwarze, Frankfurt, and Horst Fleischhauer, Grossauheim, all of Germany, assignors to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler, Germany

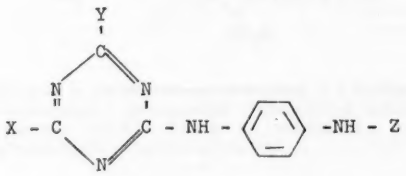
Division of Ser. No. 316,565, Dec. 19, 1972, Pat. No. 3,828,002. This application May 24, 1974, Ser. No. 473,168

Claims priority, application Germany, Dec. 27, 1971, 2164800

Int. Cl.² C07D *251/16, 251/38, 251/42*

U.S. Cl. 260—249.5 **22 Claims**

1. A 1, 3, 5-triazine of the formula:



wherein:

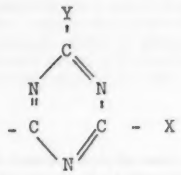
Y is (1) SR_1, where R_1 is alkyl of 1 to 12 carbon atoms, phenyl, or cresyl, (2) CN, (3) OR_2, where R_2 is alkyl of 1 to 12 carbon atoms, phenyl, alkylphenyl having 1 to 5 carbon atoms in the alkyl group, allyl or methallyl, or (4)

where R_3 and R_4 are hydrogen, allyl, methallyl, cycloalkyl of 5 to 8 carbon atoms, phenyl, methylphenyl, naphthyl or benzyl, alkyl of 1 to 18 carbon atoms, alkyl of 1 to 18 carbon atoms substituted with —OH, —CN or OR_5 where R_5 is alkyl of 1 to 18 carbon atoms, one of R_3 and R_4 is alpha or beta naphthyl with the proviso that the other is hydrogen, R_3 and R_4 together with the nitrogen atom are piperazino, piperidino, morpholino, thiomorpholino or pyrrolidino;

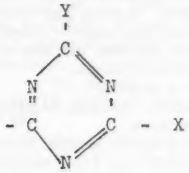
X is chlorine;

Z is alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl, benzyl, acyl of the formula:

where R_7 is alkyl of 1 to 18 carbon atoms, benzyl or phenyl or the group:



with the proviso that when Z is:



and X and Y are

at least one of R_3 and R_4 is allyl or methallyl.

3,928,345

BIS-TRIAZINOBENZIMIDAZOLES AND THEIR PREPARATION

Hans Rochling, Altenhain, Taunus; Kurt Hartel, and Reinhard Kirsch, both of Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

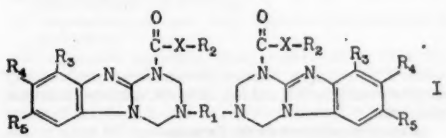
Filed July 9, 1974, Ser. No. 486,780

Claims priority, application Germany, July 11, 1973, 2335193

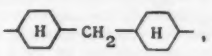
Int. Cl.² C07D *251/72*

U.S. Cl. 260—249.5 **8 Claims**

1. A compound of the formula



wherein R_1 is a straight-chain or branched (C_2–C_{16})-alkylene group, a p,p'-dicyclohexyl-methylene group of the formula



a 1,3- or 1,4-phenylene-dimethylene group or a 1,4-di-(C_2-C_4)-alkyl-piperazine group,

R_2 is a straight-chain or branched alkyl group having 1 to 4 carbon atoms,

R_3 is hydrogen or halogen,

R_4 is hydrogen or halogen, or the phenylthio, the phenoxy, ethoxy, methyl or cyano group,

R_5 is hydrogen or halogen, and

X is oxygen or sulfur.

3,928,346

SOLID HARDENER COMPOSITIONS

William A. Wentworth, Houston, Tex., assignor to Napko Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 390,047, Aug. 22, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,627

Int. Cl.² C07D *251/54*

U.S. Cl. 260—249.6 **3 Claims**

1. A method of preparing a solid hardener which comprises heating a mixture consisting of:

a. from 25 to 75 mol percent of a carboxylic acid anhydride selected from the group consisting of phthalic anhydride and hexahydrophthalic anhydride,

b. from 0 to 50 mol percent of a monocarboxylic, aromatic, non-heterocyclic acid,

c. at least 25 mol percent of hexamethoxymethyl melamine.

3,928,347

PYRAZINYLMALONIC ACID ESTERS AND SALTS AND PYRAZINYLACETIC ACIDS, ESTERS AND SALTS

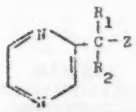
Norman Schwartz, Philadelphia, and Richard J. Mohrbacher, Fort Washington, both of Pa., assignors to McNeil Laboratories, Incorporated, Fort Washington, Pa.

Division of Ser. No. 774,486, Nov. 8, 1968, Pat. No. 3,761,477. This application Nov. 17, 1972, Ser. No. 307,682

Int. Cl.² C07D *241/02*

U.S. Cl. 260—250 B **4 Claims**

1. A member selected from the group consisting of a compound of the formula



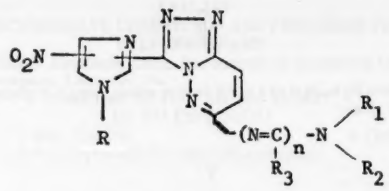
wherein R_1 is a member selected from the group consisting of hydrogen and loweralkyl; R_2 is a member selected from the group consisting of hydrogen, loweralkyl, loweralkyl carboxylate ester, and sodium, calcium, and ammonium carboxylate salts; and Z is a member selected from the group consisting of lower-alkyl carboxylate ester, carboxylic acid, and sodium, calcium, and ammonium carboxylate salts; wherein when R_2 is respectively loweralkyl carboxylate ester or carboxylate salt, Z is also respectively loweralkyl carboxylate ester or carboxylate salt.

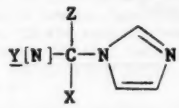
3,928,348
N-METHYL-IMIDAZOLE DERIVATIVES AND THEIR PRODUCTION

Wilfried Draber; Karl Heinz Buchel; Erik Regel, and Manfred Plempel, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 120,333, March 2, 1971, Pat. No. 3,787,415. This application Nov. 29, 1972, Ser. No. 310,400
Claims priority, application Germany, Mar. 23, 1970, 2013793
Int. Cl.² C07D 237/08
U.S. Cl. 260—250 A 7 Claims

1. A compound of the formula:





or a pharmaceutically acceptable non-toxic salt thereof, wherein

X is a heteroaromatic moiety of the formula:

unsubstituted or substituted by chlorine,

Y is phenyl unsubstituted or substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, or halogen, and

Z is phenyl.

3,928,349
NITROIMIDAZOLYL-TRIAZOLO-PYRIDAZINE COMPOUNDS

Herbert Berger, Mannheim-Kafertal; Rudi Gall, Grossachsen; Kurt Stach, Mannheim-Waldhof; Wolfgang Vomel, and Rita Hoffmann, both of Mannheim, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim, Germany

Filed Feb. 26, 1973, Ser. No. 336,099
Claims priority, application Germany, Apr. 1, 1972, 2215999
Int. Cl.² C07D 237/00
U.S. Cl. 260—250 AC 12 Claims

1. Nitroimidazolyl-triazolo-pyridazine compound of the formula:

wherein

R is hydrogen, lower alkyl, 2-hydroxyl-alkyl, 2-alkanoyloxalkyl, or 2-alkoxyalkyl, wherein the alkyl moieties contain up to 6 carbon atoms;

R_1 and R_2 are, individually, hydrogen, lower alkanoyl, aroyl, alkoxycarbonyl, alkyl, cycloalkyl, wherein the alkyl or cycloalkyl radicals may contain a hydroxyl, alkoxy or amino group or an alkyl-, alkanoyl- or aroyl- amino group; R_1 and R_2, taken together, represent with the N-atom piperidino, hydroxy-piperidino, alkyl-piperidino, piperazino, alkyl-piperazino or morpholino

R_1 and R_2, taken together, can also represent dialkylsulfimino or dialkylsulfoximino;

R_3 is hydrogen or alklyl; or

R_3, together with R_2, represents an alkylene bridge of from 3 to 4 carbon atoms;

wherein the alkyl groups or moieties contained in the R_1, R_2 and R_3 radicals are of from 1 to 6 carbon atoms in each instance, the aryl groups or moieties are of 6 carbon atoms and the cycloalkyl groups or moieties are of 3 to 8 carbon atoms; and *n* is 0 to 1; and the pharmacologically acceptable salts thereof.

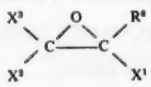
3,928,350
PREPARATION OF 3-SUBSTITUTED 2-HYDROXYQUINOXALINES BY REACTION OF O-ARYLENEDIAMINES WITH TRIHALOVINYL EPOXIDES

James E. Nottke, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 158,520, June 30, 1971, abandoned. This application Aug. 27, 1973, Ser. No. 391,524
Int. Cl.² C07D 241/36
U.S. Cl. 260—250 Q 7 Claims

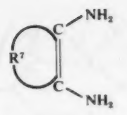
1. A process for preparing a 3-substituted 2-hydroxyquinoxaline which consists essentially of mixing

a trihalovinyl epoxide of the formula



where R^6 is hydrogen, fluorine, chlorine, lower perfluoroalkyl or phenyl: and the X's, alike or different, are fluorine or chlorine; and

an o-arylenediamine of the formula



where R^7 is divalent and completes a carbocyclic aromatic nucleus of 6 or 10 carbons which may be substituted with 1 to 3 of halogen, cyano, lower n-alkyl, lower n-alkoxy, lower n-alkoxycarbonyl, carboxyl, phenyl or phenylalkyl in an inert solvent for the diamine having a non-nucleophilic base at a temperature in the range of −25° to 120°C.

3,928,351

MULTIFUNCTIONAL PYRAZINES

Dennis Scott Donald, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 232,207, March 6, 1972, Pat. No. 3,814,757, which is a continuation-in-part of Ser. No. 133,724, April 13, 1971, abandoned. This application Oct. 5, 1973, Ser. No. 403,867

Int. Cl.² C07D *241/02*

U.S. Cl. 260—250 BN **5 Claims**

1. A compound selected from the group consisting of 2-(N-methyl-N-phenylamino)-3,5,6-tricyanopyrazine; 2-anilino-3,5,6-tricyanopyrazine; 2-allylamino-3,5,6-tricyanopyrazine; and 2-benzylamino-3,5,6-tricyanopyrazine.

3,928,352

CERTAIN SUBSTITUTED 2-PYRAZINEMETHANOLS

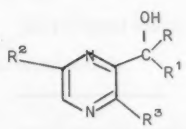
Harold M. Taylor, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 7, 1974, Ser. No. 467,708

Int. Cl.² C07D *241/12, 241/18, 241/16*

U.S. Cl. 260—250 B **6 Claims**

1. A compound of the formula



wherein

- R represents C_2–C_8 alkyl, C_3–C_8 cycloalkyl, phenyl, or phenyl mono- or disubstituted with fluoro, chloro, bromo, methyl, ethyl, trifluoromethyl, or methoxy;
- R^1 represents C_2–C_8 alkyl, phenyl, or phenyl mono- or disubstituted with fluoro, chloro, bromo, methyl, ethyl, trifluoromethyl, or methoxy;
- R^2 represents hydrogen, iodo, methyl, ethyl, methoxy, or methylthio;
- R^3 represents hydrogen, iodo, methyl, ethyl, methoxy, methylthio, or dimethylamino;

provided that either R^2 or R^3, but not both, represents hydrogen; and that both R and R^1 represent phenyl or substituted phenyl when R^3 represents a group other than hydrogen.

3,928,353

PYRIMIDYL PHOSPHORO-AND THIOPHOSPHOROAMIDATES

Karlheinz Milzner, Basel, and Fritz Reisser, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

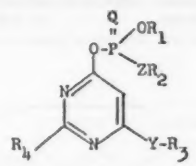
Continuation-in-part of Ser. No. 230,043, Feb. 28, 1972, Pat. No. 3,862,188. This application Nov. 28, 1973, Ser. No. 419,508

Claims priority, application Switzerland, Mar. 4, 1971, 3190/71; Jan. 12, 1972, 429/72; Aug. 20, 1971, 12298/71; Jan. 12, 1972, 430/72

Int. Cl.² C07F *9/65;* **A01N** *9/36*

U.S. Cl. 260—256.4 E **9 Claims**

1. A compound of the formula:



wherein

- R_1, R_2 and R_4 which may be the same or different, are each alkyl of 1 to 5 carbon atoms,
- R_3 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 8 carbon atoms, phenyl or phenyl mono substituted by chlorine, bromine or alkyl of 1 to 3 carbon atoms,
- Q and Y which may be the same or different, are each oxygen or sulphur and
- Z is $>NR_5$

wherein R_5 is hydrogen or alkyl of 1 to 5 carbon atoms.

3,928,354

DERIVATIVES OF 4(3H)-QUINAZOLONE, PROCESS OF PREPARATION, AND PHARMACEUTICAL COMPOSITIONS THEREOF

John Bodenham Taylor, Down Ampley, and Derek Ralph Harrison, Swindon, both of England, assignors to Roussel Uclaf, Paris, France

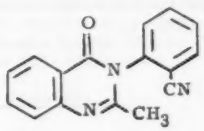
Filed Oct. 21, 1974, Ser. No. 516,779

Claims priority, application United Kingdom, Oct. 23, 1973, 49338/73

Int. Cl.² C07D *239/90*

U.S. Cl. 260—256.4 Q **3 Claims**

1. A compound selected from the group consisting of 2-methyl-3-(o-cyanophenyl)-4(3H)-quinazolone of the formula I:



I

and its pharmaceutically acceptable acid addition salts.

3,928,355

POLYMERIC-ALKYLPHENOLSULFONAMIDES

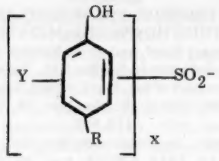
Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Oct. 26, 1972, Ser. No. 301,121

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 PL **5 Claims**

1. A sulfonamide having the substituted sulfonyl radical



wherein x is an integer from 2 to 7, R is the alkyl-substituent having a molecular weight from 85 to 3,000, and Y is hydrogen or the sulfonyl radical and wherein each sulfonyl radical is attached to a nitrogen of the aminoalkyl radical of di-(aminoalkyl) piperazine wherein the aminoalkyl-substituent has 1–10 carbon atoms.

3,928,356

10-[4-(ω-HYDROXY ALKYL)-1-PIPERAZIMYL]-DIBENZO (H,F) OXOFINS AND THIEPINS AND ACETYL ESTERS THEREOF

Suminori Umio, Kawanishi; Ikuo Ueda, Yao; Yoshinari Sato, Ikeda, and Shizuo Maeno, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Japan

Continuation of Ser. No. 874,710, Nov. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 762,998, Sept. 26, 1968, abandoned. This application Nov. 14, 1972, Ser. No. 306,394

Claims priority, application Japan, Oct. 6, 1967, 42-64540; Dec. 20, 1967, 42-81731; Jan. 29, 1968, 43-5280; Feb. 28, 1968, 43-12773; Mar. 4, 1968, 43-13966; Mar. 19, 1968, 43-18122; Apr. 10, 1968, 43-23917; June 24, 1968, 43-44033

Int. Cl.² C07D *295/04*

U.S. Cl. 260—268 TR **11 Claims**

1. A compound selected from the group consisting of 10-(4-(2-hydroxyethyl)-1-piperazinyl)dibenz(b,f)oxepin, 8-chloro-10-(4-(2-hydroxyethyl)-1-piperazinyl)-dibenzo(b,f)oxepin, 8-chloro-10-(4-(2-acetoxyethyl)-1-piperazinyl)-dibenz(b,f)oxepin, 8-chloro-10-(4-(3-hydroxypropyl)-1-piperazinyl)-dibenz(b,f)oxepin, 8-chloro-10-(4-(3-acetoxypropyl-1-piperazinyl)-dibenz(b,f)oxepin, 8-methoxy-10-(4-(2-hydroxyethyl)-1-piperazinyl)-dibenz(b,f)oxepin, 8-nitro-10-(4-(2-hydroxyethyl)-1-piperazinyl)-dibenz(b,f)oxepin, 8-nitro-10-(4-(2-(2-acetoxyethyl)-1-piperazinyl)-dibenz(b,f)oxepin, 10-(4-(2-hydroxyethyl)-1-piperazinyl)dibenz(b,f)thiepin and 8-chloro-10-(4-(2-hydroxyethyl)-1-piperazinyl)dibenz(b,f)-thiepin.

3,928,357

SUBSTITUTED PIPERAZINE DIONES AND POLYMERIC COMPOSITIONS STABILIZED THEREBY

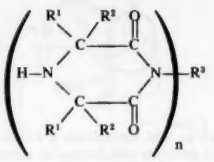
Chester E. Ramey, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 237,982, March 24, 1972, abandoned. This application Aug. 24, 1973, Ser. No. 391,200

Int. Cl.² C07D *241/04*

U.S. Cl. 260—268 TR **16 Claims**

1. A compound of the formula

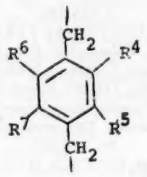


wherein

R^1 and R^2 are independently of each other methyl or ethyl or together with the carbon to which they are bound are cyclopentyl or cyclohexyl, which is unsubstituted or substituted with methyl;

n is an integer of from 1 to 3;

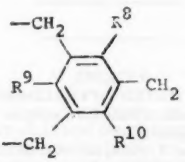
when n is 1, R^3 is alkyl of from one to 20 carbon atoms; when n is 2, R^3 is alkylene of from one to 20 carbon atoms, p-xylylene of alkyl substituted p-xylylene, of the formula



wherein

R^4, R^5, R^6 and R^7 are hydrogen or lower alkyl having from one to five carbon atoms;

when n is 3, R^3 is 1,4,5-mesitylene or 2,4,6-alkyl substituted mesitylene, of the formula



wherein

R^8, R^9, and R^{10} are hydrogen or lower alkyl, having from one to five carbon atoms.

3,928,358

PIPERAZINE DERIVATIVES

Ernst Otto Renth; Kurt Schromm; Anton Mentrup, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

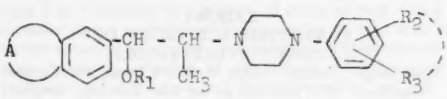
Filed May 15, 1974, Ser. No. 469,944

Claims priority, application Germany, May 21, 1973, 2325633

Int. Cl.² C07D *295/12*

U.S. Cl. 260—268 BC **4 Claims**

1. A compound of the formula



wherein

A is methylenedioxy or ethylenedioxy,

R_1 is (alkyl of one to four carbon atoms)-carbamoyl or phenyl-carbamoyl,

R_2 is hydrogen, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms, halogen or trifluoromethyl,

R_3 is hydrogen, alkyl of one to four carbon atoms, alkoxy of one to four carbon atoms or halogen, and

R_2 and R_3, together with each other and the carbon atoms of the phenyl ring to which they are attached, form the benzene ring,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,928,359

N-(FURYL-OR THIENYL-METHYL)-DESOXY-NORMORPHINES AND -NORCODEINES AND SALT THEREOF

Gerhard Walther; Herbert Merz; Adolf Langbein, and Klaus Stockhaus, all of Ingelheim, Rhine, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

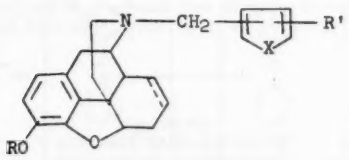
Filed Sept. 11, 1973, Ser. No. 396,171

Claims priority, application Germany, Sept. 14, 1972, 2245141

Int. Cl.² C07D *489/00*

U.S. Cl. 260—285 **6 Claims**

1. A compound of the formula



wherein

R is hydrogen, methyl or acetyl,

R' is hydrogen or methyl, and

X is oxygen or sulfur,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,928,360

1,3,4,9B-TETRAHYDRO-2H-INDENO[1,2-C]PYRIDINES

Anton Ebnother, Arlesheim; Jean-Michel Bastian, Therwil, and Erwin Rissi, Basel, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

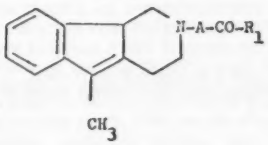
Continuation-in-part of Ser. No. 264,423, June 20, 1972, abandoned, Continuation-in-part of Ser. No. 72,800, Sept. 16, 1970, abandoned. This application Nov. 29, 1973, Ser. No. 419,991

Claims priority, application Switzerland, Sept. 23, 1969, 14317/69; Dec. 18, 1969, 18830/69; Apr. 23, 1970, 6078/70; June 3, 1970, 8267/70; Sept. 23, 1969, 14318/69; Dec. 16, 1969, 18671/69; Apr. 23, 1970, 6079/70; June 3, 1970, 8268/70; Sept. 23, 1969, 14319/69; Apr. 23, 1970, 6080/70; June 3, 1970, 8269/70

Int. Cl.² C07D *221/16*

U.S. Cl. 260—293.54 **33 Claims**

1. A pharmaceutically acceptable acid addition salt of the formula:



wherein

R_1 is lower alkyl of one to four carbon atoms, cycloalkyl of five or six carbon atoms, phenyl or phenyl monosubstituted by chlorine, bromine, fluorine, methoxy, methylthio or lower alkyl of one to four carbon atoms, and

A is a straight or branched alkylene chain of one to four carbon atoms.

3,928,361

1-(SULFAMOYLPHENYLALKYL)-3,5-DIPYRIDYL-1,2,4 TRIAZOLES

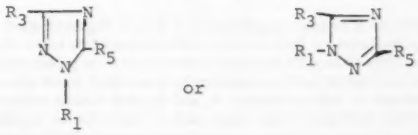
John J. Baldwin, Lansdale, and Frederick C. Novello, Berwyn, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 361,914, May 21, 1973, Pat. No. 3,882,134. This application Nov. 29, 1974, Ser. No. 527,992

Int. Cl.² C07D *213/44*

U.S. Cl. 260—294.8 F **3 Claims**

1. A compound of the formula



wherein

R_1 is loweralkyl substituted by N,N-di(C_1 to C_3) alkylsulfamoylphenyl,

R_3 is pyridyl; and

R_5 is pyridyl.

3,928,362
DERIVATIVES OF PYRAZOLO[3,4-b]THIENO[2,3-d]PYRIDINE-2-CARBOXYLIC ACIDS

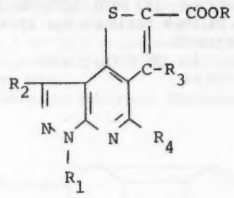
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 401,798, Sept. 28, 1973, Pat. No. 3,887,570. This application Feb. 21, 1975, Ser. No. 551,810

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 B **11 Claims**

1. A compound of the formula



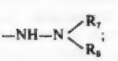
wherein

R and R_2 each is hydrogen or lower alkyl;

R_1 is hydrogen, lower alkyl, phenyl, benzyl or phenethyl;

R_3 is

or



R_4 is hydrogen, lower alkyl or phenyl;

R_5 and R_6 each is hydrogen or lower alkyl; and

R_7 and R_8 each is hydrogen, lower alkyl or phenyl.

3,928,363
ALPHA-[P-(1-CYCLOLOWER ALKENYL)-PHENYL]LOWER FATTY ACID-PYRIDYL-LOWER ALKYL ESTERS AND DERIVATIVES

Georges Haas, Oberwil; Alfred Sallmann, Bottmingen, and Alberto Rossi, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

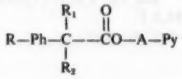
Filed Aug. 6, 1973, Ser. No. 386,133

Claims priority, application Switzerland, Aug. 16, 1972, 12129/72

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **9 Claims**

1. α-Phenyl fatty acid esters of the formula



wherein R denotes unsubstituted 5, 6 or 7 ring membered 1-cycloalkenyl, or such radical mone-substituted by lower alkyl or lower alkoxy, Ph denotes unsubstituted o- or p-phenylene, or such radical mono-substituted by lower alkyl, lower alkoxy, halogen or trifluoromethyl, R_1 and R_2 each denote independently hydrogen, lower alkyl, allyl or methallyl, or together denote lower alkylidene, A denotes straight or branched lower 1,1- 1,2- or 1,3-alkylene or a direct bond and Py denotes unsubstituted pyridyl or such radical mono-substituted by lower alkyl or lower alkoxy, wherein "lower" denotes said radicals with at most 4 carbon atoms, or therapeutically acceptable acid addition salts thereof.

3,928,364
CARBOXYLIC ACID ESTERS OF 3-BIPHENYLYL-(BUTANOLS)

Ernst Seeger; Helmut Teufel; Wolfhard Engel, and Gunther Engelhard, all of Biberach an der Riss, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

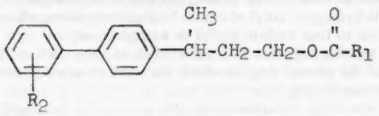
Filed June 11, 1974, Ser. No. 478,265

Claims priority, application Germany, June 16, 1973, 23308385

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295 R **4 Claims**

1. A compound of the formula



wherein

R_1 is 3-pyridyl, 4-pyridyl, [(alkyl of 1 to 3 carbon atoms)-3-pyridyl]or [(alkyl of 1 to 3 carbon atoms)-4-pyridyl], and

R_2 is hydrogen or halogen,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,928,365
PROCESS FOR THE PRODUCTION OF COMPLEX MIXTURES OF N-BENZYL-DIHYDRO-NICOTINIC ACID DIMERS AND METAL SALTS THEREOF AND DERIVATIVES THEREOF

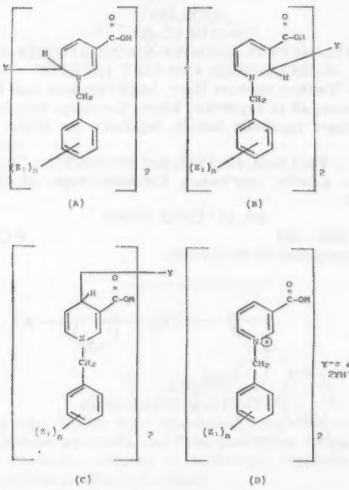
Carl C. Greco, Garnerville, N.Y.; Stanley B. Mirviss, Stamford, Conn., and Arthur E. Martell, College Station, Tex., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 193,201, Oct. 27, 1971, Pat. No. 3,781,296. This application Aug. 20, 1973, Ser. No. 389,747

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **7 Claims**

1. A process for preparing a composition comprising a complex mixture of compounds which include those corresponding to the formulae:



wherein Y in (A), (B), and (C) is selected from the group consisting of oxygen and $(S)_x$ but wherein Y in (D) is $(S)_x$; M is selected from the group consisting of hydrogen and the cations of Group IA of the Periodic Table of the Elements and ammonium; Z_1 is a halogen, x is an integer having a value of

from 1 to 4 inclusive or a mixture of values of from 1 to 4 inclusive; and *n* is an integer having a value of from 0 to 2 inclusive; said process comprising reacting a reagent selected from the group consisting of alkali metal and ammonium hydroxides and alkali metal and ammonium sulfides and polysulfides with a 1-benzyl-3-carboxy pyridinium halide; and wherein the concentration of said alkali metal or ammonium hydroxide or alkali metal or ammonium sulfide or polysulfide is about 1.5 times, on a molar basis, the concentration of said pyridinium halide.

3,928,366
PREPARATION OF 2-SUBSTITUTED-6-PYRIDYL-NICOTINIC ACIDS

Ruth Pauline Brundage, and George Y. Lesher, both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 346,190, March 29, 1973, Pat. No. 3,838,156. This application Mar. 20, 1974, Ser. No. 452,806
Int. Cl.² C07D *213/22*
U.S. Cl. 260—295.5 R **1 Claim**

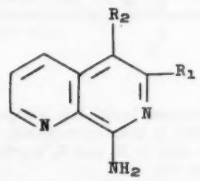
1. The process which comprises refluxing 1,2-dihydro-2-oxo-6-Q'''-nicotinonitrile in an aqueous acidic medium to produce 1,2-dihydro-2-oxo-6-Q'''-nicotinic acid, heating said 2-oxo-nicotinic acid with a halogenating agent at about 50°–110°C. to produce 2-halo-6-Q'''-nicotinic acid and heating said 2-halo compound with R_1NH_2 at about 75°–150°C. to produce 2-R_1NH-6-Q'''-nicotinic acid where R_1 is lower-alkyl and Q''' is 4(or 3)-pyridyl or 4(or 3)-pyridyl having 1 or 2 lower-alkyl substituents.

3,928,367
1-AMINO NAPHTHYRIDINES

Joseph Mayer, New York, N.Y., and Margaret H. Sherlock, Bloomfield, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 816,075, April 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 119,377, Feb. 26, 1971, abandoned. This application July 16, 1973, Ser. No. 379,525
Int. Cl.² C07D *213/74*
U.S. Cl. 260—296 B **7 Claims**

1. A 1,7-naphthyridine compound of the structural formula:



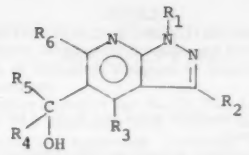
and the pharmaceutically acceptable salt thereof, wherein R_1 is pyridyl, and R_2 is selected from the group consisting of hydrogen, lower alkyl, phenyl, benzyl and phenethyl.

3,928,368
ALCOHOL DERIVATIVES OF PYRAZOLO[3,4-b]PYRIDINES

Hans Hoehn, Tegernheim, and Theodor Denzel, Nurenberg, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 12, 1973, Ser. No. 423,960
Int. Cl.² C07D *221/00*
U.S. Cl. 260—296 H **9 Claims**

1. A compound of the formula:



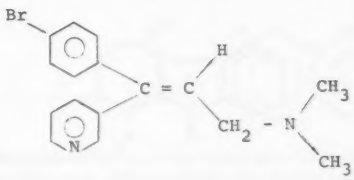
wherein R_1, R_2, and R_6 are each independently selected from the group consisting of hydrogen and lower alkyl of 1 to 4 carbons; and R_3 is selected from the group consisting of hydrogen, lower alkoxy of 1 to 4 carbons, and halogen; and R_4 and R_5 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbons, and phenyl.

3,928,369
COMPOUNDS USEFUL AS ANTIDEPRESSIVE AGENTS, AND A PROCESS FOR THEIR PREPARATION

Peder Bernhard Berntsson, Vastra Frolunda; Per Arvid Emil Carlsson, Goteborg, and Hans Rudolf Corrodi, Askim, all of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

Continuation of Ser. No. 247,101, April 24, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,051
Claims priority, application Sweden, Apr. 28, 1971, 5496/71
Int. Cl.² C07D *213/36*
U.S. Cl. 260—296 R **1 Claim**

1. A compound having the structural formula



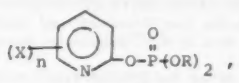
or a pharmaceutically acceptable acid addition salt thereof.

3,928,370
PROCESS FOR MAKING DIALKYL PYRIDYLPHOSPHATES

Chun Shan Wang, and Michael J. Mintz, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

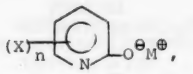
Filed Sept. 3, 1974, Ser. No. 502,481
Int. Cl.² C07D *213/00*
U.S. Cl. 260—297 P **9 Claims**

1. In the process of preparing a compound of the formula



(I)

wherein
X is fluoro, chloro or bromo,
n is an integer of from 0 to 3, inclusive, and
R is lower alkyl,
by reacting by contacting under substantially anhydrous conditions
a. an alkali metal or ammonium pyridinate of the formula



wherein M is an alkali metal and X and *n* have the aforesaid meaning,

b. a dialkyl hydrogen phosphite of the formula

wherein R has the aforesaid meaning, and

c. carbon tetrachloride,

the improvement consisting of conducting said process in the presence of a small but sufficient amount of a tertiary amine to catalyze the reaction between (a), (b) and (c),

said tertiary amine having a pKa of at least about 9.5.

3,928,371
PYRIDO-INDOLE DERIVATIVES

Giorgio Winters, and Nunzio Di Mola, both of Milan, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

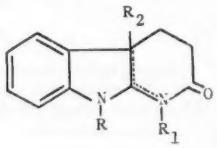
Filed Sept. 3, 1974, Ser. No. 503,026

Claims priority, application United Kingdom, Sept. 10, 1973, 42368/73

Int. Cl.² C07D *209/56*

U.S. Cl. 260—297 T **6 Claims**

1. A compound of the formula



wherein

the dotted lines represent an additional bond localized in one of the two possible positions;

R represents lower alkyl of 1 to 4 carbon atoms and benzyl;

R_1 represents hydrogen, lower alkyl of 1 to 4 carbon atoms, benzyl and lower aliphatic acyl of 1 to 4 carbon atoms and it is present only if the symbol R_2 is absent and the double bond is located between the carbon atoms in position 2 and 3 of the indole ring.

R_2 represents hydrogen, lower alkyl of 1 to 4 carbon atoms and benzyl and it is present only if the symbol R_1 is absent and the double bond is located between the positions 1 and 2 of the pyridine ring.

3,928,372
2-(3-OXYTHIAZOLYL)BENZIMIDAZOLES

Richard J. Bochis, East Brunswick, and Michael H. Fisher, Somerville, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 224,357, Feb. 7, 1972, abandoned, which is a continuation of Ser. No. 20,092, March 16, 1970, abandoned, which is a continuation of Ser. No. 775,117, Nov. 12, 1968, abandoned, which is a continuation of Ser. No. 688,373, Dec. 6, 1967, abandoned. This application Aug. 31, 1973, Ser. No. 393,515

Int. Cl.² C07D *277/30*

U.S. Cl. 260—302 H **2 Claims**

1. 2-(3-Oxythiazol-4-yl)benzimidazole.

2. 5-Isopropoxycarbonylamino-2-(3-oxythiazol-4-yl)benzimidazole.

3,928,373
1,2,3-TRIAZOLES

Gerhard Beck, Frankfurt am Main, and Dieter Günther, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

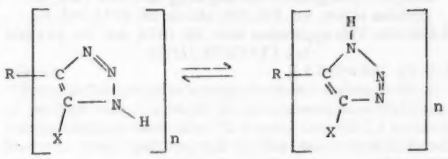
Continuation-in-part of Ser. No. 257,761, May 30, 1972, abandoned. This application Mar. 15, 1973, Ser. No. 341,799

Claims priority, application Germany, Aug. 2, 1971, 2138522

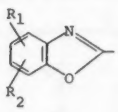
Int. Cl.² C07D *249/04*

U.S. Cl. 260—307 D **5 Claims**

1. A compound of the formula



in which *n* is 1 or 2, R is — if *n* is 1 — lower alkyl; lower alkenyl; cycloalkyl, cycloalkenyl or cycloalkdienyl of 4 to 6 carbon atoms each; phenyl; phenyl substituted by 1 to 3 radicals selected from the group consisting of lower alkyl, hydroxy, amino, lower-alkyl-amino, di-(lower alkyl)-amino, lower alkanoylamino, halogen, lower alkoxy, nitro, carboxy, lower carboalkoxy and cyano; naphthyl; anthracenyl, pyrenyl, 1-amino-anthraquinolyl; benzyl; phenethyl; styryl; furanyl; tetrahydrofuranyl, thienyl, pyridyl or benzoxazolyl and — if *n* is 2 — R is a direct bond, lower alkylene, lower alkenylene, phenylene, $-C_6H_4-$(lower alkylene), 4,4′-stilbylene or 1,4′-styrylene and X is a group of the formula



in which R_1 is hydrogen, lower alkyl, halogen, amino, lower alkanoylamino, nitro or lower carboalkoxy, R_2 is hydrogen, halogen or lower alkyl or R_1 and R_2 together stand for an annellated benzene ring.

3,928,374
NITROIMIDAZOLE DERIVATIVES

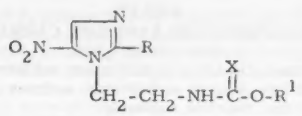
Jan Heeres, Turnhout; Joseph Hector Mostmans, Antwerpen, and Robert Maes, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 372,567, June 22, 1973, abandoned. This application Apr. 18, 1974, Ser. No. 461,821

Int. Cl.² C07D *233/95*

U.S. Cl. 260—309 **25 Claims**

1. A chemical compound selected from the group consisting of a nitroimidazole derivative having the formula:



and the therapeutically active acid addition salts thereof, wherein:

X is a member selected from the group consisting of O and S;

R is a member selected from the group consisting of hydrogen, loweralkyl, phenyl, halophenyl, halomethyl and hydroxymethyl; and

R^1 is a member selected from the group consisting of loweralkyl, loweralkenyl, cyclopentyl, cyclohexyl and loweralkoxy-loweralkyl.

3,928,375

ANTHELMINTICALLY ACTIVE 2-CARBALKOXY-AMINO-BENZIMIDAZOLYL-5(6)-AMINO-PHENYL ETHERS

Dieter Duwel, Hofheim, Taunus; Reinhard Kirsch, Niederjosbach, Taunus; Heinz Loewe, Kelkheim, Taunus, and Josef Urbanietz, Schwalbach, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

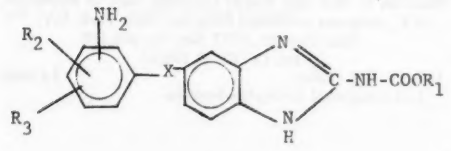
Filed Sept. 23, 1974, Ser. No. 508,337

Claims priority, application Germany, Sept. 25, 1973, 2348104

Int. Cl.² C07D *235/32*

U.S. Cl. 260—309.2 **7 Claims**

1. A 2-carbalkoxy-amino-benzimidazolyl-5(6)-aminophenyl ether of the formula



wherein R_1 is alkyl of 1 to 4 carbon atoms, R_2 and R_3, independently of one another, represent hydrogen, alkyl of 1 to 4 carbon atoms, hydroxyl, alkoxy of 1 to 4 carbon atoms, halogen or trifluoromethyl, and X is oxygen or sulfur, and the salt thereof with a physiologically tolerable acid.

3,928,376

N,N'-SUBSTITUTED 2,4,5-TRIKETOIMIDAZOLIDINES

Johannes Reese, Wiesbaden-Biebrich, and Kurt Kraft, Auringen, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

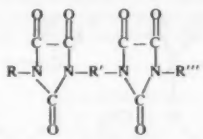
Continuation-in-part of Ser. No. 24,794, April 1, 1970, abandoned. This application Mar. 1, 1972, Ser. No. 230,989

Claims priority, application Germany, Apr. 2, 1969, 1916932; Apr. 24, 1969, 1920845

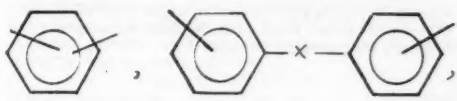
Int. Cl.² C07D *233/96*

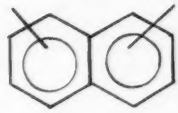
U.S. Cl. 260—309.5 **6 Claims**

1. A compound of formula



wherein R and R''' are phenyl or naphthyl that are unsubstituted or monosubstituted with nitro, halo, lower alkyl, lower alkoxy or haloalkyl; R and R''' being the same or different and R' is





that is unsubstituted or mono-substituted with lower alkyl, lower alkoxy, halo, nitro or haloalkyl, and wherein x is a bond, CH_2, O, S or sulphonylene.

3,928,377

DI-(HYDROXYALKYL) IMIDAZOLIDINEDIONES

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

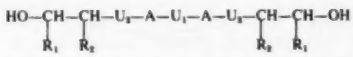
Filed July 10, 1974, Ser. No. 487,107

Claims priority, application Switzerland, July 30, 1973, 11053/73

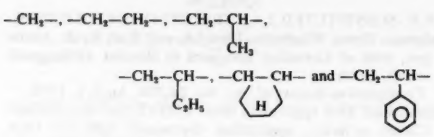
Int. Cl.² C07D *49/32*

U.S. Cl. 260—309.5 **6 Claims**

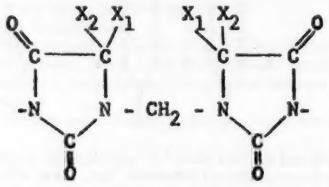
1. A di-(hydroxyalkyl) compound of the formula



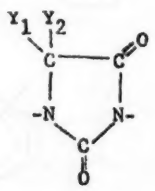
wherein each R_1 denotes a member selected from the group consisting of hydrogen, methyl, ethyl and phenyl, R_2 denotes hydrogen or together with R_1 denotes tetramethylene, A denotes a member selected from the group consisting of a divalent residue of the formulae



U_1 denotes a divalent residue of the formula



wherein X_1 and X_2 each denotes hydrogen or an alkyl with 1 to 4 carbon atoms, and U_2 has the same meaning as U_1 or denotes a residue of the formula



wherein Y_1 and Y_2 each denotes hydrogen, an alkyl with 1–4 carbon atoms or phenyl or together denote pentamethylene.

3,928,378

FUSED BICYCLIC AMINOPYRAZOLES

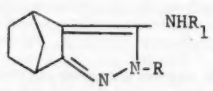
Victor J. Bauer, Somerville; Marc N. Agnew, Plainsboro, and Richard C. Effland, Somerville, all of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Jan. 30, 1974, Ser. No. 437,992

Int. Cl.² C07D *231/54*

U.S. Cl. 260—310 R **4 Claims**

1. A compound of the formula



in which R is hydrogen, alkyl of 1–4 carbon atoms, phenyl or halophenyl and R_1 is alkyl of 1–4 carbon atoms, cycloalkyl of 3–7 carbon atoms, phenyl or halophenyl.

3,928,379

NOVEL SUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS

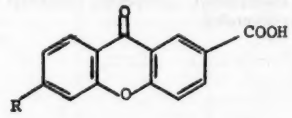
Jurg R. Pfister, Los Altos; Ian T. Harrison and John H. Fried, both of Palo Alto; all of California, assignors to Syntex, (U.S.A.) Inc., Palo Alto, California.

Division of Ser. No. 259,671, June 5, 1972, Pat. No. 3,821,252, which is a continuation-in-part of Ser. No. 231,756, Mar. 3, 1972, now abandoned. This application Feb. 7, 1974, Ser. No. 440,327.

Int. Cl. C07D *311/86*

U.S. Cl. 260/335 **4 Claims**

1. A compound selected from those represented by the following formula:



and the pharmaceutically acceptable, non-toxic alkyl or glycerol esters, unsubstituted, monoalkyl, dialkyl, dialkylaminoalkyl, alkoxyalkyl or phenethyl substituted amides and salts thereof; wherein R is a group selected from those of the formula

wherein R′ is hydrogen, lower alkyl, cycloalkyl, tetrahydrofuran-2-yl, tetrahydropyran-2-yl, tetrahydropyran-4-yl, 4-alkoxytetrahydropyran-4-yl, or carboxylic acyl containing up to 12 carbon atoms, and R′ is hydrogen; lower alkyl; cycloalkyl; phenyl; substituted phenyl, in which the substituent is halo, lower alkyl, lower alkoxy, lower alkylthio trifluoromethyl, or cyano.

3,928,380

1,1′-SPIROBIS(CYCLOPENTA-[4,5-C]PYRROLES)

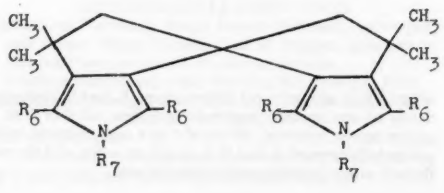
Malcolm R. Bell, and Rudolf Oesterlin, both of Rensselaer, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 29, 1973, Ser. No. 346,005

Int. Cl.² C07D *209/02*

U.S. Cl. 260—326.9 **3 Claims**

1. A compound having the formula



where each R_6 group is the same lower-alkyl; and R_7 is hydrogen, lower-alkyl, cycloalkyl or cycloalkyl-lower-alkyl containing from three to six ring carbon atoms and having a total of five to ten carbon atoms, phenyl, or phenyl substituted in the phenyl nucleus by a single member of the group consisting of lower-alkyl, lower-alkoxy, halogen, hydroxy, methylenedioxy, trifluoromethyl, lower-alkanoylamino, amino, di-lower-alkylamino, or sulfamoyl.

3,928,381
SULFURIZED AND CHLORINATED ALKYLENE POLYAMINE REACTION PRODUCT LUBRICANT ADDITIVE AND LUBRICATING COMPOSITION CONTAINING SAME

William P. Cullen, Fishkill; Harry Chafetz, Poughkeepsie, and Walter W. Hellmuth, Beacon, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 314,315, Dec. 12, 1972, Pat. No. 3,843,533. This application Apr. 22, 1974, Ser. No. 462,679

Int. Cl.² C07D *339/04*

U.S. Cl. 260—327 C **8 Claims**

1. An oil-soluble ashless sulfurized and chlorinated alkylene polyamine reaction product prepared by chlorinating a reaction product of sulfur and a polyolefin containing a trithione using at least a mole of chlorine per mole of trithione at a temperature ranging from about 20° to 95°C. to form a chlorinated intermediate product, said trithione being represented by the formula:

in which R and R′ represent hydrogen or a hydrocarbyl radical having from about 50 to 125 carbon atoms, at least one of R and R′ representing an aliphatic hydrocarbon radical, and, reacting said intermediate product with a polyamine in the proportion of 1 to 5 moles of said polyamine per mole of said intermediate product at a temperature in the range of 100° to 275°C., said polyamine being represented by the formula:

$$H_2N—(R''—NH)_x—H$$

in which R″ is a divalent alkylene radical having from 2 to 6 carbon atoms and *x* is a integer ranging from 1 to 6 to produce a reaction product characterized by consisting of from 0.10 to 5.0 weight percent sulfur, 0.10 to 5.0 weight percent chlorine and 0.10 to 5.0 weight percent nitrogen.

3,928,382
2-IMINO-1,3-DITHIETANE

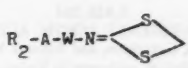
Roger Williams Addor; James Byron Lovell, both of Pennington, and Sidney Kantor, Trenton, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 235,397, March 16, 1972, abandoned. This application Aug. 14, 1974, Ser. No. 493,944

Int. Cl.² C07D *339/00*

U.S. Cl. 260—327 M **6 Claims**

1. A 2-imino-1,3-dithietane having the formula



wherein W is selected from the group consisting of methylene, ethylene, lower alkyl (C_1 – C_3) substituted methylene and lower alkyl (C_1 – C_2) substituted ethylene; A is oxygen or sulfur; and R_2 is selected from the group consisting of C_1–C_{12} alkyl, monocyclic alkyl of up to 12 carbon atoms and bicyclic alkyl of up to 12 carbon atoms, phenyl, mono and diloweralkyl (C_1–C_4) phenyl, mono and dihalophenyl, furfuryl, tetrahydrofurfuryl, alkenyl (C_2–C_6), and lower alkoxy (C_1–C_4) lower alkyl (C_2-C_3).

3,928,383
PROPYNYLAMINE-SUBSTITUTED DIBENZO[B,F]THIEPINS AND DIBENZ[B,F]OXEPINS

Jean-Pierre Kaplan, Le-Plessis-Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

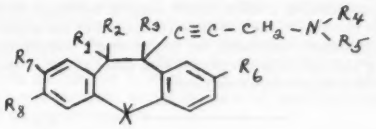
Continuation-in-part of Ser. No. 380,653, July 12, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,770

Claims priority, application Switzerland, June 8, 1973, 8354/73; May 10, 1974, 6421/74

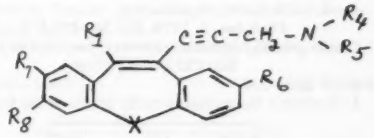
Int. Cl.² C07D *337/14*

U.S. Cl. 260—327 B **20 Claims**

1. A compound of the formula



or



wherein X is oxygen or sulfur; R_1 and R_2, independently, are hydrogen or lower alkyl; R_3 is hydrogen; R_4 and R_5, independently, are hydrogen, lower alkyl, hydroxy-lower alkyl, alkanoyloxy-lower alkyl, wherein the alkanoyloxy group contains 2 to 18 carbon atoms, or, when taken together, are a saturated 5-or 6-membered heterocyclic ring, selected from the group consisting of pyrrolidino, piperazino, piperidino, morpholino, thiomorpholino, methyl-piperidino, N′-lower alkyl-piperazino, N′-hydroxy-lower alkyl-piperazino, and N′-alkanoyloxy-lower alkyl-piperazino, wherein the alkanoyloxy group contains 2 to 18 carbon atoms; R_6 is lower alkyl, lower alkyl-sulfonyl, hydroxy, lower alkoxy, lower alkylthio, di-(lower alkyl) sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl) amino; and R_7 and R_8, independently, are hydrogen, lower alkyl, lower alkoxy, lower alkyl-sulfonyl, hydroxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl)-amino, or its corresponding N-oxide or a pharmaceutically acceptable acid addition salt thereof.

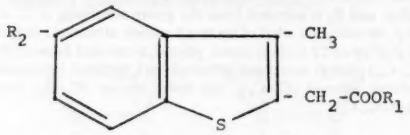
3,928,384

BENZO[B]THIENYL ACETIC ACID ESTERS

Marcel Descamps, Crainhem, and Etienne Van Durme, Wemmel, both of Belgium, assignors to Labaz, Paris, France

Filed May 7, 1973, Ser. No. 357,871
Claims priority, application United Kingdom, June 1, 1972, 25698/72
Int. Cl.² C07D 333/60
U.S. Cl. 260—330.5 3 Claims

1. A benzo thiophene compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein R_1 represents dialkylaminoalkyl in which each alkyl radical is straight- or branched-chain and has one to four carbon atoms, and R_2 represents fluorine, chlorine or bromine.

3,928,385

CONVERSION OF SULFOLENE TO SULFOLANE IN THE PRESENCE OF A TERTIARY AMINE

Edward E. Huxley, Fritch, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 15, 1973, Ser. No. 406,481
Int. Cl.² C07D 333/48
U.S. Cl. 260—332.1 8 Claims

1. In a process wherein a sulfolene compound is contacted with a hydrogenation catalyst under suitable hydrogenation conditions to convert said sulfolene compound to the corresponding sulfolane compound, the improvement comprising contacting said sulfolene compound with said catalyst in the presence of a hexamethylenetetramine.

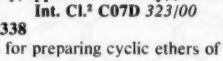
3,928,386

PROCESS FOR PREPARING CYCLIC POLYETHERS

Johannes Dale, Stasjonsveien 63, 1310 Bloomenholm; Gerd Borgen, Grinda 4, Oslo 8, and Kari Daasvatn, Waerpen Gard, 3475 Saetre, all of Norway

Filed Jan. 3, 1974, Ser. No. 430,510
Claims priority, application Norway, Jan. 12, 1973, 165/73
Int. Cl.² C07D 323/00
U.S. Cl. 260—338 8 Claims

1. A process for preparing cyclic ethers of the formula:



in which n is an integer of from 3 to 11, by oligomerization of ethylene oxide, which process consists of conducting the oligomerization in the presence of a catlyst selected from the group consisting of boron trifluoride phosphorus pentafluoride and antimony pentafluoride and in the presence of benzene as an inert solvent said oligomerization being performed with cooling to a temperature of 20°C or less, and recovering said cyclic ethers.

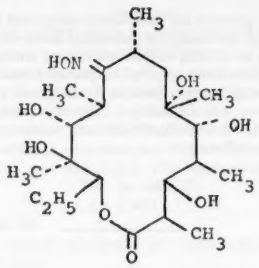
3,928,387

ANTIBIOTIC 1745A/X AND METHODS FOR THE PRODUCTION THEREOF

Richard Wightman Kierstead; Ronald Andrew LeMahieu, both of North Caldwell, and David Pruess, Passaic, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 4, 1974, Ser. No. 438,987
Int. Cl.² C07D 313/00
U.S. Cl. 260—343 2 Claims

1. The compound of the formula



3,928,388

PREPARATION OF UNSATURATED-HYDROCARBYL COUMARYL ETHERS

Paul H. Reichenbacher, Elk Grove Village, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 20, 1973, Ser. No. 426,982
Int. Cl.² C07D 311/16
U.S. Cl. 260—343.2 16 Claims

1. A process for the preparation of an ethylenically unsaturated-hydrocarbyl coumaryl-ether which comprises reacting an ethylenically unsaturated-hydrocarbyl hydroxyaryl ether with an ethylenic compound in the presence of an atmosphere comprising an oxygen-containing gas and a catalyst system consisting essentially of a metal or metal salt independently selected from Group VIII of the Periodic Table optionally in the presence of a metal or metal salt selected from the Transition Series of the Periodic Table at reaction conditions, and recovering the resultant ethylenically unsaturated-hydrocarbyl coumaryl ether.

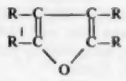
3,928,389

OXIDATIVE DEHYDROGENATION OF ALKENES OR ALKADIENES TO FURAN COMPOUNDS

Floyd E. Farha, Jr.; Marvin M. Johnson, and Donald C. Tabler, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 16, 1973, Ser. No. 389,738
Int. Cl.² C07D 307/36
U.S. Cl. 260—346.1 R 13 Claims

1. A process which comprises reacting at least one unsaturated acyclic feed hydrocarbon selected from the group consisting of alkenes and alkadienes having from 4 to 10 carbon atoms, with oxygen in contact with a catalyst consisting essentially of iron, phosphorus and oxygen, with the iron-to-phosphorus atom ratio being in the range of 2:1 to about 20:1, under suitable vaporphase reaction conditions for the conversion of said at least one unsaturated acyclic feed hydrocarbon to at least one furan compound having the formula



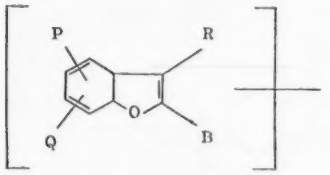
wherein each R is individually selected from the group consisting of hydrogen and alkyl radicals having from 1 to 6 carbon atoms, the total carbon atoms in the R radicals being in the range of 0 to 6; and recovering at least a portion of the furan compounds thus produced.

3,928,390
CERTAIN 2-SUBSTITUTED PHENYL AND SUBSTITUTED NAPHTHYL BENZOFURANS

Wilfried Sahm, Kelkheim, Taunus, and Gunter Rosch, Altenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed Aug. 10, 1972, Ser. No. 279,735
Claims priority, application Switzerland, Aug. 13, 1971, 11925/71
Int. Cl.² C07D *307/85, 307/92*
U.S. Cl. 260—346.2 R **5 Claims**

1. A compound fo the formula



in which

P and Q, which are equal or different, are hydrogen, halogen, lower alkyl, lower alkoxy, phenyl, sulfo or its alkali metal salt or P and Q together are lower alkylene or an annellated benzene nucleus;

R is hydrogen or lower alkyl;

B is cyanophenyl, cyanonaphthyl, carboxyphenyl, carboxynaphthyl, lower carboalkoxy-phenyl, lower carboalkoxynaphthyl or lower carboalkoxyphenyl or -naphthyl being substituted in the alkyl moiety by di-(lower alkyl) amino;

M is hydrogen or alkali metal and

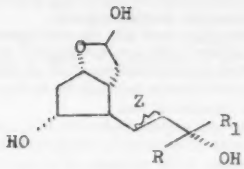
m is a number from zero to 4.

3,928,391
CERTAIN CYCLOPENTAFURAN DIOLS SUBSTITUTED BY CERTAIN-3-HYDROXYALKYL (OR ALKENYL) GROUPS USEFUL IN THE PREPARATION OF PROSTAGLANDIN ANALOGS

Hans-Jurgen E. Hess, Old Lyme; Leonard J. Czuba, New London, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 335,586, Feb. 26, 1973, Pat. No. 3,883,513, which is a continuation-in-part of Ser. No. 177,102, Sept. 1, 1971, abandoned. This application Aug. 27, 1974, Ser. No. 501,189
Int. Cl.² C07D *307/77*
U.S. Cl. 260—346.2 R **1 Claim**

1. A compound



the structure:

wherein

R is hydrogen or alkyl having 1 to 3 carbon atoms;

and R_1 is alkyl having from 5 to 11 carbon atoms; and

Z is a single bond or a trans double bond, provided that when R is hydrogen, Z is a single bond.

3,928,392
OXIDATION OF BUTANE TO MAKE ANHYDRIDE AND CATALYST THEREFOR

Wesley E. Cherry, Prospect Park; Alan F. Dickason, Chester, both of Pa., and John A. Hedge, Wilmington, Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

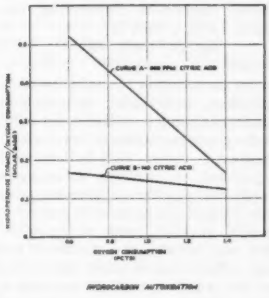
Filed Oct. 17, 1973, Ser. No. 407,340
Int. Cl.² C07D *307/56*
U.S. Cl. 260—346.8 A **9 Claims**

1. A process for the vapor phase oxidation of butane to form maleic anhydride which comprises reacting butane with oxygen or air at temperatures of from abut 350° to 650°C in the presence of a catalyst composition containing antimony, molybdenum and a third metal selected from the group consisting of nickel, cobalt, copper, and zinc, wherein said catalyst contains at least about 40 atomic percent antimony, less than about 20 atomic percent molybdenum, and less than about 40 atomic percent of said third metal, based on the total metals of the composition, wherein the contact time of the butane with the catalyst is from about 0.001 to 10 seconds, and wherein the mole ratio of butane to oxygen in the feed stream is no greater than 1:4.

3,928,393
PROCESS FOR THE PREPARATION OF OXIRANE COMPOUNDS

Stanley Herzog, Tenafly, N.J., assignor to Halcon International, Inc., New York, N.Y.

Filed Apr. 9, 1969, Ser. No. 814,693
Int. Cl. C07d *1/12, 1/08*
U.S. Cl. 260—348.5 L **10 Claims**



1. The process for the preparation of an oxirane compound by a process comprising the steps of:

a. molecular oxygen oxidation of a hydrocarbon in the presence of a liquid phase reaction medium to produce an

organic hydroperoxide corresponding in carbon structure to the hydrocarbon starting material;

b. incorporating citric acid with the said organic hydroperoxide in amount sufficient to suppress iron-catalyzed hydroperoxide decomposition without adversely affecting the subsequent reaction between the hydroperoxide and the olefinic compound; and

c. reacting the said organic hydroperoxide containing said citric acid with an olefinically unsaturated compound in the liquid phase in the presence of an epoxidation catalyst.

3,928,394

BENZYL AND (BENZYL)BENZYLANTHRAQUINONES

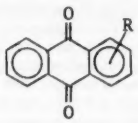
David A. Orser, Liverpool, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Jan. 11, 1973, Ser. No. 322,636

Int. Cl.² C07C *49/68*

U.S. Cl. 260—369 **4 Claims**

1. A chemical compound having the formula



where R is $C_6H_5—CH_2—$.

4. The compound named 2(p-benzyl)-benzylanthraquinone.

3,928,395

PROCESS FOR THE NITRATION OF AROMATIC COMPOUNDS

Zdenek Seha, Basel, and Tibor Somlo, Birsfelden, both of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Sept. 26, 1973, Ser. No. 400,758

Claims priority, application Switzerland, Oct. 5, 1972, 14563/72; Dec. 6, 1972, 17767/72

Int. Cl.² C07C *79/37*

U.S. Cl. 260—369 **7 Claims**

1. A process for the nitration of unsubstituted or substituted benzene, napthalene, anthracene, anthraquinone, phenanthrene, phenanthrenequinone, wherein the substituents are selected from the group consisting of lower alkyl, halo, nitro, lower alkylsulphonyl, lower N,N-dialkylsulphonamide or lower alkoxycarbonyl; or perylene, dibenzpyrene, benzanthrone, anthranthrone, pyanthrone, dibenzopyrenequinone or dibenzanthrone wherein the nitration is carried out at a temperature of −40°C to +80°C with 90 to 100% nitric acid, nitrogen oxides, acetylnitrate, or a mixture of said nitric acid and acetic acid, sulfuric acid or acetic anhydride, in a dipolar aprotic solvent that is inert towards the nitrating agent and has a boiling point over 80°C and has a dielectric constant of over 30, the amount of aprotic solvent present being at most 50% by weight of the reaction mixture, wherein the reaction is halted by addition to the mixture of additional sufficient amount of said dipolar aprotic solvent, after the desired degree of nitration has been attained.

3,928,396

ANTHRAQUINONE DYESTUFFS

Noboru Kishi; Yoshitaka Ota, and Nobuyoshi Okuno, all of Kita-Kyushu, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

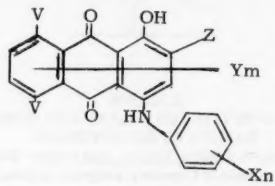
Filed Apr. 16, 1973, Ser. No. 351,454

Claims priority, application Japan, Apr. 15, 1972, 47-38035; Apr. 15, 1972, 47-38035; Apr. 15, 1972, 47-38036

Int. Cl.² C09B *1/50*

U.S. Cl. 260—380 **4 Claims**

1. An anthraquinone dye having the formula



wherein X and Y represent chlorine or bromine; Z represents chlorine, bromine or methyl; one V substituent represents a hydroxyl group and the second V substituent represents an amino group; and *m* and *n* represent 0 – 3.

3,928,397

NEW 5-CHOLESTENE DERIVATIVES AND PREPARATION THEREOF

Nobuo Ikekawa; Masuo Morisaki; Julieta Rubio Lightbourn, all of Tokyo, and Masao Seki, Komae, all of Japan, assignors to Eisai Co., Ltd., Japan

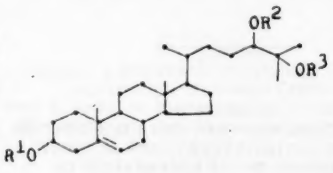
Continuation-in-part of Ser. No. 446,108, Feb. 26, 1974. This application Jan. 6, 1975, Ser. No. 538,772

Claims priority, application Japan, Mar. 2, 1973, 48-24261; Mar. 2, 1973, 48-24262

Int. Cl.² C07J *9/00*

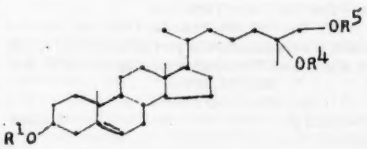
U.S. Cl. 260—397.2 **9 Claims**

1. 5-Cholestene derivatives represented by the formula:



Ia

or



Ib

wherein R^1 is hydrogen, alkanoyl, aroyl or hydroxy-protecting group, and each of R^2, R^3, R^4 and R^5 is hydrogen, alkanoyl, aroyl or trialkylsilyl.

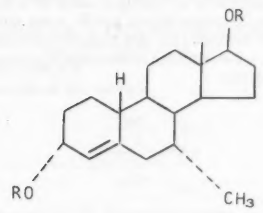
3,928,398

DERIVATIVES OF 7α-METHYLESTR-4-EN-3α,17β-DIOL

Joyce F. Grunwell, Hamilton, and Harvey D. Benson, Cincinnati, both of Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Nov. 1, 1973, Ser. No. 411,791
Int. Cl.² C07J *17/00*
U.S. Cl. 260—397.5 **4 Claims**

1. An essentially pure 7α-methylestr-4-ene-3α,17β-diol having the formula



wherein each R is selected from the group consisting of hydrogen, acyl having from 1 to 12 carbon atoms, 1-cycloalkenyl having from 5 to 8 carbon atoms, 1-methoxycycloalkyl and 1-ethoxycycloalkyl in which the cycloalkyl group has from 5 to 8 carbon atoms, 2-tetrahydropyranyl, and trialkylsilyl in which the alkyl group contains from 1 to 4 carbon atoms.

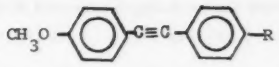
3,928,399

NEMATIC LIQUID CRYSTAL 4-METHOXY-4'-HYDROXYTOLAN ESTERS

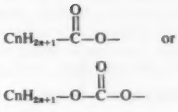
André Couttet; Jean Claude Dubois, and Annie Zann, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 8, 1974, Ser. No. 431,719
Claims priority, application France, Jan. 12, 1973, 73.1083
Int. Cl.² C07C *69/96, 69/28;* G01N *33/00;* G02F *1/13*
U.S. Cl. 260—410.5 **12 Claims**

1. A nematic liquid crystal compound of the formula:



wherein R is



and *n* is an integer from 1 to 10.

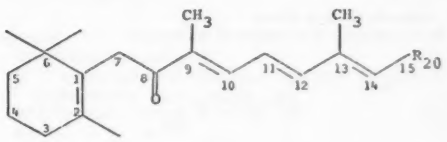
3,928,400

PROCESS FOR PRODUCING VITAMIN A

Gary Lee Olson, Westfield, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 303,162, Nov. 2, 1972, abandoned. This application Apr. 26, 1974, Ser. No. 464,398
Int. Cl.² C11C *3/02*
U.S. Cl. 260—410.9 V **15 Claims**

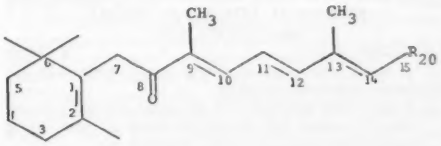
1. A process for producing an all trans isomer of a compound of the formula:



wherein R_{20} is $-CH_2OR_1$ or $-\overset{O}{\overset{\|}{C}}-OR_1'$;

R_1 is alkanoyl containing from 2 to 18 carbon atoms, or aroyl and R_1' is alkyl, aryl or aralkyl;

comprising providing a compound of the formula:

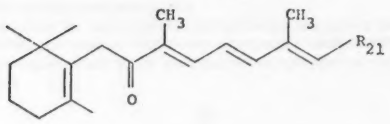


wherein R_{20} is as above; and

wherein said compound is a mixture of isomers or in an isomeric form other than the all trans form; and treating said

compound with an organic amine base or an organic acid at a temperature of from 20° to 160°C.

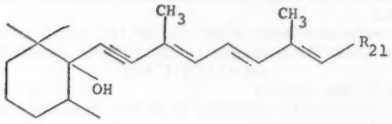
4. A process for producing a compound of the formula:



wherein R_{21} is $-CH_2OR_1$ or $-\overset{O}{\overset{\|}{C}}-OR_1'$;

R_1 is alkanoyl containing from 2 to 18 carbon atoms, or aroyl ,and R_1' is alkyl containing from 2 to 18 carbon atoms, aryl or aralkyl

comprising treating in an inert organic solvent, at a temperature of from 35° to 200°C, a compound of the formula:



wherein R_{21} is as above

in the presence of a catalyst of the formula:

$$[(R_4)-Si-O]_m-V=O$$
$$[OR_5]_n$$

wherein R_4 is alkyl, cycloalkyl, aryl, aryl lower alkyl, or cycloalkyl substitued lower alkyl; R_5 is R_4 or $(R_4)_3$-Si; m is an interger from 1 to 3; and n is an interger from 0 to 2, with the proviso that the sum of m and n is 3.

3,928,401

WATER SOLUBLE TRIGLYCERIDE COMPOSITIONS AND METHOD FOR THEIR PREPARATION

Robert J. Sturwold, and Fred O. Barrett, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Jan. 31, 1974, Ser. No. 438,283

Int. Cl.² C11C *3/02*

U.S. Cl. 260—410.7 **6 Claims**

1. A water soluble mixed ester product obtained by the single-step transesterification of:

a. a triglyceride selected from the group consisting of animal oils, animal fats, drying vegetable oil, semi-drying vegetable oils and non-drying vegetable oils;

b. a polyoxyethylene glycol having an average molecular weight from about 400 to 800; and

c. a carboxylic acid containing one or two carboxyl groups and from 2 to 12 carbon atoms; said reactants (a), (b) and (c) respectively comprising 5 to 35%, 60 to 85% and 1 to 20%, by weight, of the total charge.

3,928,402

ETHYL 2-TRANS,4-CIS-UNDECADIENOATE

Ferdinand Naf, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed Dec. 21, 1971, Ser. No. 210,620

Claims priority, application Switzerland, Dec. 22, 1970, 19018/70; Apr. 29, 1971, 6354/71

Int. Cl.² C07C *69/52;* **A61K** *7/46*

U.S. Cl. 260—410.9 R **1 Claim**

1. Ethyl 2-trans, 4-cis-undecadienoate.

3,928,403

PROCESS FOR PREPARING FARNESYL ACETIC ACID ESTERS AND 2-SUBSTITUTED-PRODUCTS THEREOF

Yoshiji Fujita, Kurashiki; Yoshiaki Omura, Okayama; Takashi Nishida, and Kazuo Itoi, both of Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

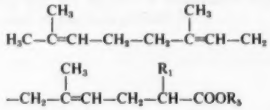
Filed July 10, 1974, Ser. No. 487,043

Claims priority, application Japan, July 13, 1973, 48-79448

Int. Cl.² C11C *3/02*

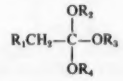
U.S. Cl. 260—410.9 N **12 Claims**

1. A process for preparing farnesyl acetic acid esters of the formula (I):



(I)

wherein R_1 represents a hydrogen atom or a hydrocarbon radical of 1 to 20 carbon atoms, and R_5 is the same as R_2, R_3 or R_4 below in formula (II), said process comprising reacting nerolidol with a 2-substituted orthoacetic acid ester derivative of the formula (II):



wherein R_1 is as defined in formula (I) above and R_2, R_3 and R_4, which may be the same or different, each represents an alkyl group of 1 to 8 carbon atoms or a cycloalkyl group of 3 to 8 carbon atoms; in the presence of an acidic catalyst.

3,928,404

PROCESS FOR THE PREPARATION OF HIGH MOLECULAR WEIGHT ALIPHATIC MONOCARBOXYLIC ACIDS BY SILICATE CONTACT AND CHROMOSULFURIC ACID OXIDATION OF α-OLEFINS

Werner Strabberger, Gersthofen, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 15, 1974, Ser. No. 497,745

Claims priority, application Germany, Aug. 21, 1973, 2342089

Int. Cl.² C11C *1/00*

U.S. Cl. 260—413 **4 Claims**

1. A process for the preparation of high molecular weight saturated aliphatic carboxylic acids being color-stable to ammonia and amines, by oxidation of α-olefins or α-olefin mixtures having from 16 to 70 carbon atoms in the molecule with chromosulfuric acid, which comprises in a first step intensely contacting in the melt said α-olefins or α-olefin mixtures having vinyl double bonds and olefins having vinylidene double bonds and olefins having transvinylene double bonds with from 0.01 to 5.0 weight %, relative to the olefins, of a silicate having a lamellar structure at a temperature of 120° to 350°C and in a second step carrying out the oxidation with aqueous chromosulfuric acid at a temperature of 80° to 150°C.

3,928,405
METHODS OF MANUFACTURING HEAVY METAL TRINITRO RESORCINATE

John Francis Hobbs, Sutton Coldfield, and William Melville, Birmingham, both of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Oct. 26, 1973, Ser. No. 410,092
Claims priority, application United Kingdom, Nov. 9, 1972, 51680/72
Int. Cl.² C07F 7/24
U.S. Cl. 260—435 A 20 Claims

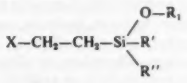
1. A method of manufacturing lead styphnate comprising continuously flowing solutions of a trinitro resorcinate and a lead salt into a reaction vessel, continuously agitating the contents of the reaction vessel, flowing the contents of the reaction vessel through a plurality of chambers wherein the reaction vessel and at least one of said plurality of chambers are maintained at a temperature of 45° to 70°C, and wherein said reaction vessel is connected in series with said chambers, to an outlet from which lead trinitro resorcinate and remaining solution is continuously drawn off, and within each chamber continuously agitating the contents of that chamber.

3,928,406
PLANT GROWTH REGULANT COMPOSITIONS AND METHODS

Robert W. Leeper, Chalfont, and Paul Strohm, Philadelphia, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Apr. 4, 1973, Ser. No. 347,736
Int. Cl.² C07F 7/04, 7/18
U.S. Cl. 260—448.8 R 5 Claims

1. Compounds of the formula



wherein X is chlorine or bromine; R_1 is selected from the group consisting of

polyether of the formula $-(C_nH_{2n}O)_y-R_4$ wherein $n=2$ or 3, y may be any integer from 2 to 100, and R_4 is a terminal group selected from the group consisting of hydrogen, alkyl, phenyl, chlorophenyl; benzyl and chlorobenzyl;

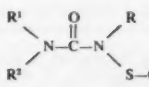
and ketal; and wherein R′ and R″ are each independently selected from the group consisting of alkyl, phenyl, chlorophenyl, benzyl and chlorobenzyl.

3,928,407
HERBICIDAL N-OXYTHIO-SUBSTITUTED UREAS

Melancthon S. Brown, deceased, late of Berkeley, Calif. (by Gustave K. Kohn, administrator), and Gustave K. Kohn, Berkeley, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 250,907, May 8, 1972, Pat. No. 3,853,966, which is a continuation-in-part of Ser. No. 189,732, Oct. 15, 1971, abandoned, which is a continuation-in-part of Ser. No. 88,212, Nov. 9, 1970, Pat. No. 3,755,437, which is a continuation-in-part of Ser. No. 88,105, Nov. 9, 1970, Pat. No. 3,679,733. This application July 11, 1974, Ser. No. 483,583
Int. Cl.² C07C 179/22
U.S. Cl. 260—453 R 15 Claims

1. A urea compound of the formula



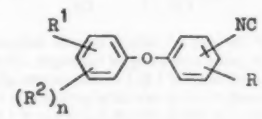
wherein R, R^1 and R^2 individually are hydrogen, alkyl of 1 to 6 carbon atoms, cycloalkyl or bicycloalkyl of up to 10 carbon atoms, alkoxy of 1 to 4 carbon atoms, carbocyclic mononuclear or binuclear aryl of 6 to 12 carbon atoms substituted with up to 2 fluorine, chlorine, bromine, nitro, trifluoromethyl or alkoxy of 1 to 4 carbon atoms; and R^3 is alkyl of 1 to 10 carbon atoms, cycloalkyl or bicycloalkyl of up to 10 carbon atoms, or carbocyclic mononuclear or binuclear aryl of 6 to 12 carbon atoms substituted with up to 2 fluorine, chlorine, bromine, nitro, trifluoromethyl, or alkoxy of 1 to 4 carbon atoms.

3,928,408
ISOCYANO-DIPHENYL ETHERS

Ingeborg Hammann, Cologne; Peter Hoffmann, Leverkusen; Dieter Marquarding, Odenthal-Globusch; Ivar Ugi, Grunwald, and Gunter Unterstenhöfer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 10, 1973, Ser. No. 359,165
Claims priority, application Germany, May 27, 1972, 2225873
Int. Cl.² C07C 119/02
U.S. Cl. 260—465 F 7 Claims

1. An isocyanodiphenyl ether of the formula



(I)

in which

R is hydrogen or halogen,

R^1 is cycloalkyl, alkyl substituted cycloalkyl, halogen or alkylmercapto,

R^2 is hydrogen, halogen or methyl, and

n is 1, 2 or 3.

3,928,409
CATALYTIC PROCESS FOR PREPARING UNSATURATED NITRILES FROM OLEFINS, AMMONIA AND OXYGEN

Francesco Pignataro, Gallarate (Varese); Franco Faletti, Milan; Arsenio Castellan, Bollate (Milan); Alessandro Bossi, Novara; Paolo Marinozzi, and Nicola Giordano, both of Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Oct. 22, 1974, Ser. No. 516,999
Claims priority, application Italy, Jan. 21, 1974, 19613/74
Int. Cl.² C07C 120/14
U.S. Cl. 260—465.3 4 Claims

1. The process for the preparation of acrylonitrile or methacrylonitrile from propene or respectively isobutene, by reaction in the gas phase, with ammonia and oxygen in the presence of a solid catalyst, at a temperature between 350°C and 550°C, said process being characterized in that the catalyst system consists of the elements tellurium, cerium, molybdenum, of one or both the elements selected from the group consisting of nickel and cobalt, chemically combined with oxygen, and the various elements are present in the atomic ratios defined by the following empirical formula:

$$A_x \quad Ce_y \quad Te_r \quad Mo_{12} \quad O_z$$

wherein:

A is Ni and/or Co

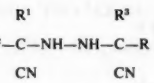
$x = 0.3–5$
$y = 1–10$
$v = 1–10$ and
z is a number indicating the amount of oxygen bound to the other elements and corresponding to the oxidation state in which they exist in the catalyst, said catalyst being obtained by mixing compounds of Mo, Ce, Te and of at least one element selected from the group consisting of Ni and Co in an aqueous medium, and then drying the mixture and heating it in the presence of air at a temperature ranging from 450°C to 700°C.

3,928,410
PROCESS FOR THE PRODUCTION OF HYDROZONITRILES

John Michael Jablonski, Over, and John Miller, Mapperley, both of England, assignors to Fisons Ltd., England

Filed Sept. 23, 1974, Ser. No. 508,271
Claims priority, application United Kingdom, Oct. 2, 1973, 45904/73
Int. Cl.² C07C *120/02*
U.S. Cl. 260—465.5 R **8 Claims**

1. A process for the production of a hydrazonitrile having the formula:



wherein R^1, R^2, R^3 and R^4, which may be different, are selected from the group consisting of hydrogen, alkyl of 1 to 8 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, phenyl which may be substituted by up to two alkyl groups of 1 to 4 carbon atoms, phenylalkyl in which the alkyl group is of 1 to 4 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms, alkoxyphenyl in which the alkoxy group is of 1 to 4 carbon atoms, carboxyalkyl in which the alkyl group is of 1 to 4 carbon atoms, and R^1 and R^2 together or R^3 and R^4 together completing a cycloalkyl group of 5 to 12 carbon atoms; provided that R^1, R^2, or R^3 and R^4, are not both hydrogen;

which process comprises reacting 1 molar proportion of an azine reactant selected from the group consisting of

a. the corresponding azine, and

b. hydrazine and the corresponding alkehyde or ketone, with at least 2 molar proportions of sodium or potassium cyanide, in the presence of a stoichiometric excess of concentrated acid selected from the group consisting of formic, acetic and propionic acids and mixtures thereof.

3,928,411
NEW QUATERNARY COMPOUNDS HAVING ANTI-MICROBIAL ACTIVITY

Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 39,536, May 21, 1970, abandoned. This application Sept. 24, 1973, Ser. No. 400,097
Int. Cl.² C07C *93/04, 93/197, 103/737, 87/30*
U.S. Cl. 260—468 G **4 Claims**

1. A chemical compound having the structural formula

$$[RCOO(CH_2)_nN(CH_3)_2R^1]X$$

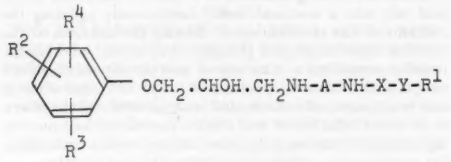
wherein R is 1— adamantyl, R^1 is a long chain alkyl group of 10 to 18 carbon atoms, n is an integer from 1 to 3 and X is a compatible halide.

3,928,412
1-ARYLOXY-3-UREIDOALKYLAMINO-2-PROPANOLS

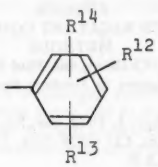
Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 4, 1973, Ser. No. 421,669
Claims priority, application United Kingdom, Dec. 15, 1972, 57970/72; Sept. 17, 1973, 43478/73
Int. Cl.² C07C *121/80, 127/19*
U.S. Cl. 260—465 D **12 Claims**

1. An alkanolamine selected from compounds of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms, wherein R^1 is hydrogen, or alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



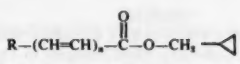
wherein R_2, R^3, R^{12} and R^{13}, which may be the same of different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or aralkoxy each of up to 12 carbon atoms; wherein R^4 is hydrogen, hydroxy or hydroxymethyl or aralkoxy of up to 12 carbon atoms; wherein R^{14} is hydrogen, amino or dialkylamino of up to 12 carbon atoms; wherein X is carbonyl (—CO—) and wherein Y is imino (-NH-), or alkylimino of up to 6 carbon atoms and the acid-addition salts thereof.

3,928,413
CYCLOPROPANEMETHYL ESTERS

Clive A. Henrick, and Gerardus B. Staal, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 350,708, April 13, 1973, which is a continuation-in-part of Ser. No. 263,902, June 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 255,368, May 22, 1972, abandoned. This application Nov. 5, 1973, Ser. No. 412,806
Int. Cl.² C07C *69/76*
U.S. Cl. 260—469 **9 Claims**

1. A compound of formula (A)



wherein *n* is one or two and R is phenyl or naphthyl, each optionally substituted by one or more of the groups, alkyl of one to ten carbon atoms, phenyl, phenylalkyl of seven to 10 carbon atoms, chlorine or bromine, one of said groups being in the para-position relative to the acid group.

7. The compound, cyclopropanemethyl 1-naphthoate.

8. The compound, cyclopropanemethyl 4-phenylbenzoate.

9. The compound, cyclopropanemethyl 4-octylbenzoate.

3,928,414

ALICYCLIC ACID AND DERIVATIVES THEREOF

Katsuhisa Shimizu, Kyoto; Shuhei Ishibe, Nara; Toshiharu Okumichi, Amagasaki, and Keizo Matsumoto, Osaka, all of Japan, assignors to Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

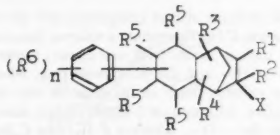
Filed Dec. 13, 1973, Ser. No. 426,935

Claims priority, application Japan, Dec. 16, 1972, 47-126346

Int. Cl.² C07C *63/00, 69/76*

U.S. Cl. 260—469 **6 Claims**

1. A resin having a formula of



wherein each of R^1, R^2, R^3 and R^4 is a hydrogen atom or methyl group, R^5 represents a hydrogen atom or alkyl group having 1 to 4 carbon atoms and four R^5's may be the same of different, R^6 is an alkyl group having 1 to 6 carbon atoms, *n* is 0 or an integer of 1 to 5 and X is —COOM or —$COOR^a$, M being a hydrogen atom, alkali metal, $—NH_4$ or organic amine residue, R^a being an alkyl group having 1 to 4 carbon atoms.

3,928,415

BENZOPHENONE DERIVATIVES AND PROCESS FOR THEIR PRODUCTION II

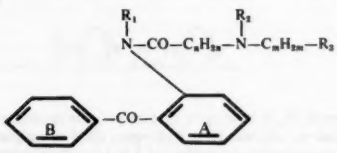
Heinz Günter Greve, and Klaus Resag, both of Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur AKT, Frankfurt am Main-Fechenheim, Germany

Division of Ser. No. 358,455, May 8, 1975, Pat. No. 3,888,899. This application Aug. 26, 1974, Ser. No. 500,286

Int. Cl.² C07C *149/40, 79/46*

U.S. Cl. 260—470 **3 Claims**

1. Benzophenone derivative having the structural formula:



and the acid addition salts thereof,

wherein R_1 and R_2 are substituents selected from the group consisting of hydrogen, saturated and unsaturated alkyl groups having 1 – 4 carbon atoms; R_3 is a substituent selected from the group consisting of —$COOCH_3$ and —$COOC_2H_5$; *n* is an integer selected from 1 and 2; and *m* is an integer selected from 1, 2 and 3; and wherein the ring A may be substituted with a substituent selected from the group consisting of halogen, nitro, trifluoromethyl, methyl, methoxy and methylmercapto, and the ring B may be substituted with a substituent selected from the group consisting of fluorine and chlorine.

3,928,416

HERBICIDAL 4-TRIFLUOROMETHYL-4'NITRODIPHENYL ETHERS

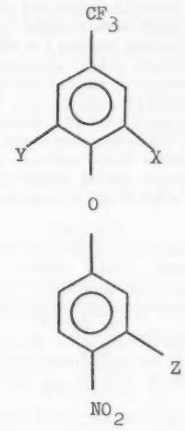
Horst O. Bayer, Levittown; Colin Swithenbank, Perkasie, and Roy Y. Yih, Doylestown, all of Pa., assignors to Rohm & Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 234,651, March 14, 1972, Pat. No. 3,789,276. This application Feb. 12, 1973, Ser. No. 331,719

Int. Cl.² C07C *101/54*

U.S. Cl. 260—471 R **6 Claims**

1. A compound of the formula



wherein

X is a hydrogen atom, a halogen atom, a trifluoromethyl group, or a (C_1–C_4)alkyl group,

Y is a hydrogen atom, a halogen atom, or a trifluoromethyl group, and

Z is a carboxy group, a carbalkoxy group having up to 4 carbon atoms in the alkoxy moiety, a carboxyalkyl group having up to 4 carbon atoms, a carbalkoxyalkyl group having up to 6 carbon atoms.

3,928,417

INTERMEDIATES FOR OXA-PHENYLENE PROSTAGLANDINS

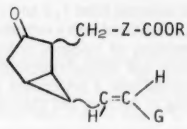
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,845

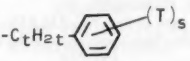
Int. Cl.² C07C *65/72, 67/76*

U.S. Cl. 260—473 A **7 Claims**

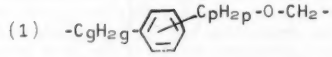
1. An optically active compound of the formula



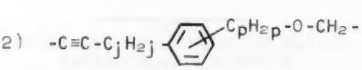
or a racemic compound of that formula and the mirror image thereof, wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between —CH=CH— and the ring, wherein T is alkyl of one 4 carbon atoms, inclusive, fluoro, chloro, trifluoromethyl, or —OR_6, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2 or 3, with the proviso that not more than two T's are other than alkyl; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; wherein Z is



wherein C_gH_{2g} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between —CH_2— and the ring, wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between the ring and —O—, and wherein C_gH_{2g} and C_pH_{2p} together represent zero to 8 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; or



wherein C_jH_{2j} represents a valence bond or alkylene of one or 2 carbon atoms with one chain carbon atom between —C C— and the ring, wherein C_pH_{2p} is defined as above, and wherein C_jH_{2j} and C_pH_{2p} together represent zero to 6 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive, and wherein ~ indicates attachment of a group to the cyclopentane ring in alpha or beta configuration and to the cyclopropane ring in exo or endo configuration.

3,928,418

$PGF_2\alpha$ -OXA PHENYLENE COMPOUNDS

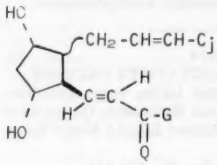
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

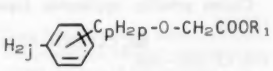
Continuation-in-part of Ser. No. 302,567, Oct. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,572, March 5, 1971, abandoned. This application July 18, 1974, Ser. No. 489,848

Int. Cl.² C07C *65/22, 69/76*

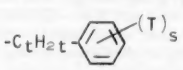
U.S. Cl. 260—473 A **31 Claims**

1. An optically active compound of the formula:





or a racemic mixture of that compound and the enantiomer thereof, wherein C_jH_{2j} represents a valence bond or alkylene of one or 2 carbon atoms with one chain carbon atoms between —CH=CH— and the phenylene ring; wherein C_pH_{2p} represents a valence bond or alkylene of one to 4 carbon atoms, inclusive, with one or 2 chain carbon atoms between the ring and the —O—; wherein C_jH_{2j} and C_pH_{2p} together represent zero to 6 carbon atoms, inclusive, with total chain lengths zero to 3 carbon atoms, inclusive; wherein G is (1) alkyl of 2 to 10 carbon atoms, inclusive, substituted with zero, one, 2, or 3 fluoro or (2) a monovalent moiety of the formula



wherein C_tH_{2t} represents a valence bond or alkylene of one to 10 carbon atoms, inclusive, substituted with zero, one, or 2 fluoro, with one to 7 carbon atoms, inclusive, between

and the ring, wherein T is alkyl of one to 4 carbon atoms, inclusive, fluoro, chloro, trifuluromethyl, or —OR_6, wherein R_6 is hydrogen or alkyl of one to 4 carbon atoms, inclusive, and wherein s is zero, one, 2, or 3, with the proviso that not more than two T's are other than alkyl; wherein Q is

wherein R_2 is hydrogen or alkyl of one to 4 carbon atoms, inclusive; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive, wherein ~ indicates attachment of the side chain to the cyclopentane ring in alpha or beta configuration; including the lower alkanoates thereof and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

3,928,419
PROCESS FOR THE PRODUCTION OF RESORCYLIC ACID ESTERS

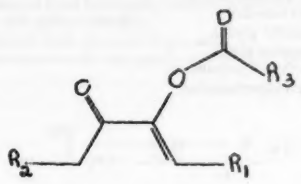
Kenneth K. Light, Asbury Park, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 379,488, July 16, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,780

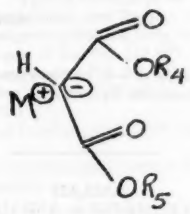
Int. Cl. C07c *69/78*

U.S. Cl. 260—473 S **4 Claims**

1. A process for preparing a C_1–C_4 alkyl-3-lower alkyl, 6-methyl resorcylate comprising the step of intimately admixing at a temperature of from 0°C up to 150°C an α-acyloxy, α,β-unsaturated alkenone having the structure:



and a malonic ester salt having the structure:



wherein R_1 represents methyl, R_2 represents C_1–C_4 alkyl, R_4 and R_5 are the same or different and represent C_1–C_4 lower alkyl, R_3 is selected from the group consisting of hydrogen, methyl and ethyl and M is alkali metal in the presence of an inert solvent.

3,928,420
MIXED ESTERS OF POLYBASIC SATURATED ACIDS, GLYCOLS AND GLYCIDYL ESTERS

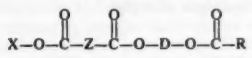
James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed June 12, 1973, Ser. No. 369,174

Int. Cl.² C07C *69/30, 69/80*

U.S. Cl. 260—475 P **8 Claims**

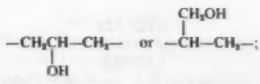
1. A compound represented by the structure



where

X is the residue of
ethylene glycol
1,2-propanediol
1,3-propanediol
1,4-butanediol
1,5-pentanediol
glycerol
1,2,3-butanetriol
1,2,3,4-butanetetrol
1,6-hexanediol
neopentyl glycol
diethylene glycol
trimethylolpropane or
trimethylpentanediol;

D is



R is an alkyl radical of 4–18 carbon atoms, or a singly, doubly or triply unsaturated hydrocarbon radical of 17 carbon atoms;

and

Z is

where A and B can be the same or different and are hydrogen or —COOH.

3,928,421
ANTI-GASTRIC ULCER CHALCONE ETHERS

Kazuaki Kyogoku, Tokyo; Katsuo Hatayama, Saitama; Sadakazu Yokomori, and Teruya Seki, both of Tokyo, all of Japan, assignors to Taisho Pharmaceutical Co., Ltd., Tokyo, Japan

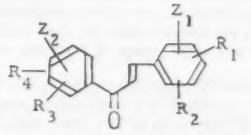
Filed June 25, 1974, Ser. No. 483,004

Claims priority, application Japan, Oct. 30, 1973, 48–12199; Jan. 19, 1974, 49–8736; Jan. 19, 1974, 49–8737; Feb. 9, 1974, 49–16524

Int. Cl.² C07C *69/02, 49/84*

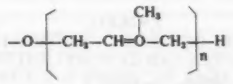
U.S. Cl. 260—479 R **21 Claims**

1. A chalcone ether represented by the formula (I)



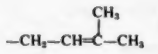
(I)

wherein R_1, R_2, R_3 and R_4 are independently a member selected from the group consisting of hydrogen, hydroxy, alkyl of 1–5 carbons, alkoxy of 1–5 carbons and alkanoyloxy of 1–5 carbons and one of Z_1 and Z_2 is a member selected from the group consisting of the groups represented by the formula (II)



(II)

wherein *n* is 1 or 2 and the other of Z_1 and Z_2 is a member selected from the group consisting of the groups represented by the formula (II) and (III)



(III)

3,928,422

SULFOSUCCINATES OF POLYHYDROXY TERTIARY AMINES

Bjorn Sundby, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 6, 1971, Ser. No. 205,395

Int. Cl.² C07C *143/12*

U.S. Cl. 260—481 R **3 Claims**

1. Disodium sulfosuccinate of N-(2-hydroxy-hexadecyl) diethanolamine.

3,928,423

MONOMERIC EMULSION STABILIZERS

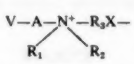
Carlos M. Samour, Wellesley Hills, and Mildred C. Richards, Wakefield, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Division of Ser. No. 272,282, July 17, 1972, abandoned, which is a division of Ser. No. 867,899, Oct. 20, 1969, Pat. No. 3,780,092. This application Aug. 9, 1974, Ser. No. 496,321

Int. Cl.² C07C *101/20*

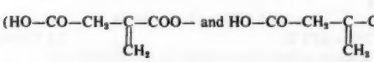
U.S. Cl. 260—482 P **3 Claims**

1. Compounds corresponding to the formula



wherein

V is selected from the class consisting of acid ester groups and acid amido groups derived from maleic, (HO—CO—CH=CH—COO— and HO—CO—CH=CH—CONH—), citraconic, (HO—CO—CH=C(CH_3)—COO — and HO—CO—CH=C(CH_3)CONH—), and itaconic acids

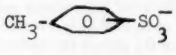


A is selected from the class consisting of ethylene, propylene, isopropylene, and hydroxypropylene groups;

R_1 and R_2 are selected from the class consisting of benzyl groups and alkyl groups of from one to seven carbon atoms;

R_3 is selected from the class consisting of $—CH_2—CO—OR$ groups wherein R is a saturated aliphatic hydrocarbon group of from seven to 28 carbon atoms;

and X is a radical selected from the class consisting of F^-, Cl^-, Br^-, I^-, $CH_3SO_4^-$, $C_2H_5SO_4^-$, and



3,928,424

MIXED ESTERS OF DIBASIC UNSATURATED ACIDS, GLYCOLS AND GLYCIDYL ESTERS

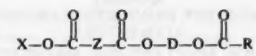
James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Mar. 5, 1973, Ser. No. 338,053

Int. Cl.² C07C *69/52*, *69/60*

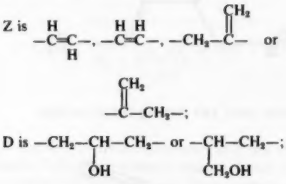
U.S. Cl. 260—485 G **8 Claims**

1. A compound represented by the structure



where

X is the residue of ethylene glycol, 1,2-propanediol, 1,3-propanediol, 1,4-butanediol, 1,5-pentanediol, glycerol, 1,2,3-butanetriol, 1,2,3,4-butanetetrol, 1,6-hexanediol, neopentyl glycol, diethylene glycol, trimethylol propane or trimethylpentanediol;



and

R is an alkyl radical of 4–18 carbon atoms, or singly, doubly or triply unsaturated hydrocarbon radical of 17 carbon atoms.

3,928,425

11β,15β-PGE$_2$,15β-PGF$_2\alpha$, AND 15β-PGF$_2\beta$, 15-ACETATES METHYL ESTERS

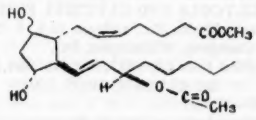
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 159,478, July 2, 1971, Pat. No. 3,772,350, which is a continuation-in-part of Ser. No. 71,390, Sept. 11, 1970, abandoned. This application Oct. 3, 1973, Ser. No. 403,091

Int. Cl.² C07C *177/00*

U.S. Cl. 260—488 R **4 Claims**

1. A compound of the formula:



wherein R_9 is hydrogen or acetyl.

3,928,426

1-CYCLOPROPYL-1-PHENYL-OMEGA-AMINO-1-LOWER ALKANOYLOXYALKANES

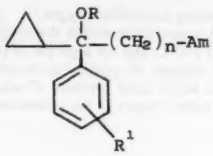
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 221,804, Jan. 28, 1972, abandoned. This application Apr. 1, 1974, Ser. No. 456,940

Int. Cl.² C07C *69/14*, *69/24*

U.S. Cl. 260—490 **4 Claims**

1. A compound selected from those having the formula



wherein;
Am is lower-alkylamino, di-lower-alkylamino,
R is a lower alkanoyl,
R^1 is selected from hydrogen, halogen, lower-alkoxy, lower-alkyl and trifluoromethyl,
n is selected from two and three, and
the pharmaceutically acceptable acid addition salts thereof.

3,928,427
N,N'-BRIDGED-BIS[2-ALKYL-2-HYDROXYETHYLAMINE]SALTS

Guy D. Diana, Stephentown, and Royal A. Cutler, Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 123,097, March 10, 1971, abandoned. This application Feb. 14, 1973, Ser. No. 332,267
Int. Cl.² C07C *91/02*
U.S. Cl. 260—501.17 **14 Claims**

1. N,N'-(1,6-hexylene)-bis[2-hydroxyundecylamine]diglycolate.

2. N,N'-(1,6-hexylene)-bis[N-methyl-2-hydroxyundecylamine] dihydrobromide.

3,928,428
PROCESS FOR THE PRODUCTION HYDROGENATED OLEFIN SULFONATES

Gar Lok Woo, Tiburon, and William A. Sweeney, Larkspur, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 317,565, Dec. 22, 1972, abandoned, which is a continuation of Ser. No. 764,682, Oct. 3, 1968, abandoned. This application Apr. 18, 1973, Ser. No. 352,151
Int. Cl.² C07C *143/02*
U.S. Cl. 260—513 T **20 Claims**

1. In a process for preparing mixtures of hydrogenated olefin sulfonates by hydrogenating a sulfonated product produced by sulfonating straight chain olefins with SO_3, the hydrogenation being carried out at temperatures of from about 20°C to about 200°C in the presence of 0.05 to 30% by weight based on the sulfonated product of a hydrogenation catalyst until from 50 to 100 percent of the carbon-carbon double bonds in the product are saturated, the improvement which comprises treating said sulfonated product immediately prior to hydrogenation with an oxidizing agent having an oxidation potential greater than that of the hydrogen on platinum electrode in an acidic solution, wherein said oxidizing agent is employed in sufficient quantity to provide at least 0.05 parts of oxygen or the oxidizing equivalent of another oxidizing agent per hundred parts of the sulfonated product.

3,928,429
METHOD OF PREPARING ARYL ACETIC ACIDS

Moustafa El-Chahawi, Troisdorf, and Hermann Richtzenhain, Much-Schwellenbach, both of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany

Filed Nov. 16, 1973, Ser. No. 416,566
Claims priority, application Germany, Dec. 4, 1972, 2259072
Int. Cl.² C07C *51/12*
U.S. Cl. 260—515 R **12 Claims**

1. A process for preparing an aryl acetic acid which comprises initially heating to 30°–70°C and thereafter contacting a compound of the formula

wherein Ar is an aromatic residue and X is a halogen with at least a stoichiometric amount relative to the halogen of carbon monoxide and a stoichiometric excess up to 1.8 times the stoichiometric amount of an alkali or an alkaline earth metal oxide, hydroxide or carbonate in the presence of a cobalt or iron carbonyl catalyst and in the additional presence of a mixture of water and an alcohol and thereafter subjecting the reaction mixture to a treatment with a strong acid.

3,928,430
METHOD FOR THE PREPARATION OF 3,3-METHYLENEBIS (BENZOIC ACID)

Norbert J. Mruk, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed July 19, 1974, Ser. No. 490,207
Int. Cl.² C07C *63/33*
U.S. Cl. 260—515 P **9 Claims**

1. A method for the preparation of 3,3'-methylenebis (benzoic acid), said method comprising:

A. reacting benzoic acid and formaldehyde in the presence of dilute sulfuric acid at a temperature of from about 60° to 120°C. to prepare a heterogeneous reaction mixture, said reaction mixture comprising first and second solid components of methylenebis (benzoic acid) and benzoic acid, respectively, and an acid phase;

B. filtering said heterogeneous reaction mixture to obtain said first and second solid component products;

C. adding water at a temperature of between 70° and 100°C. to said solid products to form an aqueous solution of said second component; and

D. filtering said aqueous solution and recovering said first component solid.

3,928,431
METHOD OF ISOLATING L-DOPA FROM A AQUEOUS SOLUTION THEREOF

Thord Broderman; Pentti Hietala, and Jacobus Sundman, all of Helsinki, Finland, assignors to Oy Medica Ab, Helsinki, Finland

Continuation-in-part of Ser. No. 377,585, July 9, 1973, abandoned. This application Oct. 15, 1973, Ser. No. 406,145
Claims priority, application Finland, July 14, 1972, 2027/72
Int. Cl.² C07C *101/77*
U.S. Cl. 260—519 **10 Claims**

1. A process for the isolation of 3-(3,4-dihydroxyphenyl)-L-alanine from an aqueous solution thereof, said process comprising extracting an aqueous solution of 3-(3,4-dihydroxyphenyl)-L-alanine with a liquid ion exchanger comprising a sulfonic acid selected from the group consisting of alkyl-, aryl- and ester-sulfonic acids dissolved in an organic solvent selected from the group consisting of alcohols, esters and ketones which are insoluble or sparingly soluble in water to bind the 3-(3,4-dihydroxyphenyl)-L-alanine to said sulfonic acid in the form of a sulfonic acid salt, liberating said 3-(3,4-dihydroxyphenyl)-L-alanine from said salt by neutralization with

a base that precipitates the 3-(3,4-dihydroxyphenyl)-L-alanine, separating the precipitate from the solution and regenerating the sulfonic acid by treating the solution with a mineral acid, said sulfonic acid being thereafter used in a subsequent extraction.

3,928,432
PROCESS FOR PREPARATION OF 2-METHOXY-3,6-DICHLORO-BENZOIC ACID

Heinz Manfred Becher, Bingen (Rhine), and Richard Sehring, Ingleheim am Rhein, both of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Germany

Filed June 19, 1974, Ser. No. 480,685

Claims priority, application Germany, June 22, 1973, 2331712

Int. Cl.² C07C *65/02*

U.S. Cl. 260—521 H **5 Claims**

1. A process for the preparation of 2-methoxy-3,6-dichlorobenzoic acid comprising the steps of

electrolytically debrominating 2-methoxy-5-bromo-3,6-dichlorobenzyl alcohol to produce 2-methoxy-3,6-dichlorobenzyl alcohol,

oxidizing said 2-methoxy-3,6-dichlorobenzyl alcohol to produce 2-methoxy-3,6-dichlorobenzoic acid, and

recovering said 2-methoxy-3,6-dichlorobenzoic acid.

3,928,433
PROCESS FOR PREPARING MESITYLENIC ACID

Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 18, 1972, Ser. No. 315,809

Int. Cl.² C07C *63/32*, *51/33*

U.S. Cl. 260—524 R **14 Claims**

1. A process for converting mesitylene to mesitylenic acid of high purity and of good color which comprises continuously passing a mixture consisting essentially of mesitylene, oxygen, a lower carboxylic acid and a cobalt compound soluble in said lower carboxylic acid through a reaction zone at a temperature of about 80° to about 160° C. for about 5 minutes to about 10 hours to obtain a reaction mixture consisting essentially of mesitylene, mesitylenic acid, cobalt, said lower carboxylic acid and water of reaction, subjecting said reaction mixture to a temperature of about 50° to about 150° C. to remove therefrom an azeotrope containing mesitylene and water, cooling the remainder of the distillation mixture to a temperature of about +50° to about −10° C. to recrystallize mesitylenic acid therein, separating mesitylenic acid from the remainder of said distillation mixture and then recycling the remaining lower carboxylic acid and cobalt to the reaction zone.

3,928,434
OXIDATIVE REMOVAL OF IMPURITIES FROM ACETIC ACID

John Brian Saunby, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 2, 1973, Ser. No. 347,125

Int. Cl.² C07C *51/42*

U.S. Cl. 260—541 **17 Claims**

1. Process for the reduction in the content of oxidizable impurities in acetic acid produced by hydrocarbon oxidation, which process comprises contacting:

a. acetic acid, in the liquid phase, wherein said acetic acid contains (i) oxidizable impurity comprising alpha, beta-olefinically unsaturated ketone, and (ii) a catalytically effective quantity of a soluble transition metal acetate, said transition metal being a metal of Group VB, VI B, VII B, or VIII of the Periodic Table, excluding the noble metals of Group VIII; with

b. a gas containing molecular oxygen,

at an elevated temperature within the range of from about 75° to about 150°C. and for a period of time sufficient to reduce the content of oxidizable impurities to a level wherein the acetic acid product of said process has a rating of at least 2 hours in the potassium permanganate time test.

3,928,435
PROCESS FOR THE CONTINUOUS PRODUCTION OF HIGHLY PURE SODIUM FORMATE

Yasushi Awane, Niigata; Sadao Otsuka, Nagareyama; Masao Nagata, and Fumio Tanaka, both of Niigata, all of Japan, assignors to Mitsubishi Gas Chemical Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1974, Ser. No. 496,561

Claims priority, application Japan, Aug. 13, 1973, 48-90052

Int. Cl.² C07C *51/00*

U.S. Cl. 260—542 **6 Claims**

1. In a process for continuous production of sodium formate solution by reaction between an aqueous sodium hydroxide solution and excessive carbon monoxide under pressure in a tower type reactor, the improvement comprising introducing both reactants into said tower and subjecting the same to co-current contact as they progress therethrough.

3,928,436
CARBAMOYL SULFOXIDE DERIVATIVES

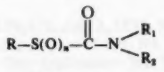
Harry Tilles, El Cerrito, and John E. Casida, Berkeley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 280,373, Aug. 14, 1972, abandoned. This application June 18, 1973, Ser. No. 371,328

Int. Cl.² C07C *147/11*

U.S. Cl. 260—551 R **56 Claims**

1. A compound represented by the following formula:



wherein *n* is 1 or 2; R is selected from the group consisting of lower alkyl, haloalkyl, ethoxyalkenyl and alkenyl; R_1 and R_2 can be the same or different and are selected from the group consisting of lower alkyl, cycloalkyl having 3–8 carbon atoms cyclohexylmethyl, alkenyl and alkynyl, said alkyl, alkenyl and alkynyl having straight or branched chain configuration having 1–6 carbon atoms, inclusive.

3,928,437
PHENOXY-PHENYL, PHENYLTHIOPHENYL, PHENYLSULFONYLPHENYL AND PHENYLAMINOPHENYL DIAMINOTHIOUREAS

Rudiger Spaun, Bottmingen; Alain Claude Rochat, Birsfelden; Jean-Jacques Gallay, Magden, and Paul Brennelsen, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

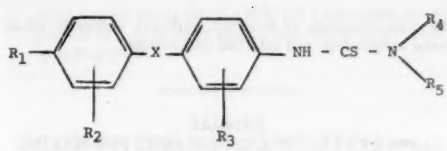
Division of Ser. No. 175,723, Aug. 27, 1971, Pat. No. 3,781,290. This application Oct. 11, 1973, Ser. No. 405,619

Claims priority, application Switzerland, Sept. 2, 1970, 13111/70; Dec. 23, 1970, 19065/70

Int. Cl.² C07C *157/09*

U.S. Cl. 260—552 R **4 Claims**

1. A compound of the formula



in which R_1 is hydrogen, halogen, nitro, low alkyl, low alkoxy or low alkylthio, each of the latter having alkyl groups with 1 to 4 carbon atoms; R_2 is hydrogen, halogen, nitro, low alkyl or low alkoxy; R_3 is hydrogen; each of R_4 and R_5 is alkyl of from 1 to 4 carbon atoms; and X is imino.

3,928,438
PROCESS FOR PREPARATION OF UREA AUTOCONDENSATION PRODUCT

Alvin F. Beale, Jr., and John M. Lee, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 865,208, Oct. 9, 1969, abandoned. This application Apr. 7, 1972, Ser. No. 242,221

Int. Cl.² C07C *127/24*

U.S. Cl. 260—553 B **5 Claims**

1. A process for preparing a biuret product which comprises:

providing a reaction mixture of urea in a glycol diether carrier liquid, the relative proportions of urea to diether on a weight basis ranging from about 90:10 to about 10:90, said glycol diether corresponding to the formula R′—O—R—O—$_n$R″ wherein R is ethyl or propyl, R′ and R″ are alkyl radicals containing from one to four carbon atoms, and *n* is an integer ranging from one to six, said ethers being further characterized as having a boiling point of no less than 110°C and a density less than that of urea,

heating said reaction mixture, thereby dissolving the urea, initially at a temperature of from above 150°C to about 210°C for a period of from about 10 minutes to about 2 hours and cooling to a temperature within the range of from about 115°C to below 150°C for a period of time which provides for substantial conversion of said urea to a product high in biuret while simultaneously minimizing formation of other urea autocondensation byproducts, and

contacting the resulting product mixture with water to precipitate the biuret product and recovering the solid biuret product from the residual liquid.

3,928,439
MANUFACTURE OF CARBOXAMIDES

Toni Dockner, Meckenheim, and Rolf Platz, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Apr. 10, 1974, Ser. No. 459,458

Claims priority, application Germany, Apr. 19, 1973, 2320060

Int. Cl.² C07C *103/00*

U.S. Cl. 260—557 R **11 Claims**

1. A process for the manufacture of carboxamides by the addition of water to nitrile in the presence of a copper-containing catalyst, wherein the reaction is carried out using a catalyst which contains copper and a magnesium silicate which has been manufactured by precipitation of a magnesium compund with an alkali metal silicate in an aqueous mother liquor in a ratio of 1 to 5 moles of alkali metal silicate per mole of magnesium compound at a temperature of from 15° to 50°C and in the presence of a copper compound, which catalyst has been treated with a reducing gas at elevated temperature to reduce the copper compound to mainly non-ionized copper and 0.1 to 30%, based on the total copper content of the catalyst, of a compound of monovalent or divalent copper.

3,928,440
ACRYLONITRILE HYDROLYSIS AND CATALYST USEFUL THEREFOR

Ronald J. Allain, Brookhaven, Miss., and Virgil L. Seale, Houston, Tex., assignors to Nalco Chemical Company, Chicago, Ill.

Filed July 29, 1974, Ser. No. 492,865

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **7 Claims**

1. In a process wherein acrylonitrile is hydrolyzed with water in the presence of a copper catalyst, the improvement which comprises using as said catalyst a particulate copper catalyst which has been prepared by contacting alloy particles comprised of copper and aluminum wherein the weight ratio of aluminum to copper ranges from about 70:30 to 30:70 with water having a pH in the range of from about 5.5 to 7.5 for a time sufficient to produce evolution of hydrogen gas from such particles.

3. In an improved process for preparing a copper catalyst, the improvement which comprises contacting alloy particles comprised of copper and aluminum wherein the weight ratio of aluminum to copper ranges from about 70:30 to 30:70 with water having a pH in the range of from about 5.5 to 7.5 for a time sufficient to produce evolution of hydrogen gas from such alloy particles.

3,928,441
RANEY COPPER CATALYST PRODUCTION AND USE

Wood Eugene Hunter, Lombard, and Karl H. Hoffmann, Brookfield, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Aug. 8, 1974, Ser. No. 495,566

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 N **21 Claims**

1. In an improved process for preparing a Raney copper type catalyst, the steps comprising contacting at a temperature below about 80°C particles of an alloy comprised of aluminum and copper in a weight ratio of from about 70:30 to 30:70, said particles ranging in size from about 0.001 to 0.5 inch, with an aqueous solution having dissolved therein from greater than 0 up to 25 weight percent of at least one material selected from the group consisting of amine bases, ammonia, and alkali metal hydroxide for a time sufficient to remove from said particles at least about 25 weight percent of the aluminum present therein on a total initial particle weight pasis, and further contacting such particles simultaneously and/or sequentially during said contacting an aqueous solution having dissolved therein from greater than 0 to up to about 25 weight percent of at least one amino carboxylic acid compound for a time of at least about ½ hour, each said amine base being selected from the group consisting of alkyl amines, alkanol amines, and quaternary ammonium hydroxides, each said amino carboxylic acid compound being characterized by containing at least three carbon atoms per molecule, at least one nitrogen atom per molecule, and at least one carboxyl group per molecule, each such carboxyl group being either in the acid form or in a salt form, by having a solubility in water at a pH greater than 10 to an extent such that about a 5 weight percent solution thereof can be formed at room temperature conditions, and by having a molecular weight not more than about 1000.

19. A process for hydrolyzing an olefinic nitrile comprising the steps of:

A. Contacting at a temperature below about 80°C particles of an alloy comprised of aluminum and copper in a weight ratio of from about 70:30 to 30:70, said particles ranging in size from about 0.001 to 0.5 inch, with an aqueous

solution having dissolved therein from greater than 0 up to about 25 weight percent of at least one material selected from the group consisting of amine bases, ammonia, and alkali metal hydroxide for a time sufficient to remove from said particles at least about 25 weight percent of the aluminum present therein on a total initial particle weight basis, each said amine base being selected from the group consisting of alkyl amines, alkanol amines, and quaternary ammonium hydroxides.

B. Further contacting such particles simultaneously and/or sequentially during said contacting with an aqueous solution having dissolved therein from greater than 0 up to about 25 weight percent of at least one amino carboxylic acid compound for a time of at least about ½ hour, each said amino carboxylic acid compound being characterized by containing at least three carbon atoms per molecule, at least one nitrogen atom per molecule, and at least one carboxyl group per molecule, each such carboxyl group being either in the acid form or in a salt form, by having a solubility in water at a pH greater than 10 to an extent such that about a 5 weight percent solution thereof can be formed at room temperature conditions, and by having a molecular weight not more than about 1000.

C. Still further contacting the so-washed particles with a composition comprising from about 10 to 75 weight percent acrylonitrile with the remainder up to one hundred weight percent thereof being water at a temperature ranging from about 150° to 300°F. for a time sufficient to convert at least some of said olefinic nitrile to the corresponding amide.

3,928,442

METHOD OF PRODUCING ACRYLAMIDE WITH A NITROGEN BASE ACTIVATED COPPER CATALYST

Virgil L. Seale, Houston, Tex., and Ronald J. Allain, Brookhaven, Miss., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Aug. 26, 1974, Ser. No. 500,600
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N **11 Claims**

1. In the process wherein acrylonitrile is hydrolyzed with water in the presence of a copper catalyst, the improvement which comprises using as said catalyst a particulate copper catalyst which comprises from about 2 to 45 weight percent aluminum with the balance up to 100 weight percent thereof (total catalyst dry weight basis) being copper, said catalyst having been prepared by contacting a prechosen starting group of copper/aluminum alloy particles having an aluminum to copper ratio of from about 70:30 to 30:70 with a liquid aqueous medium containing dissolved therein from greater than 0 to about 50 weight percent of organic nitrogen base selected from the group consisting of ammonia, alkyl amines, alkanol amines, quaternary ammonium compounds, and mixtures thereof for a time sufficient to remove at least about 1 weight percent of the total starting aluminum content of said group of alloy particles (total starting alloy particle weight basis).

10. In an improved process for making a catalyst adapted for use in hydrolyzing acrylonitrile to acrylamide, the improvement which comprises contacting a metal alloy comprised of copper and aluminum in particular form with an aqueous liquid medium containing dissolved therein from greater than 0 to about 50 weight percent organic amine base and from greater than 0 to about 30 weight percent of at least one hydroxylated hydrocarbon compound characterized by having at least two carbon atoms per molecule and by having at least two groups per molecule, at least one of said groups being hydroxyl, the other of said groups being selected from the class consisting of hydroxyl, carboxyl, aldehyde, alkali metal carboxylate, and esterfied carboxylate.

3,928,443

COPPER CATALYST AND PROCESSES FOR MAKING AND USING

Ronald J. Allain, Brookhaven, Miss., and Virgil L. Seale, Houston, Tex., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Sept. 20, 1974, Ser. No. 507,818
Int. Cl.² C07C *103/08*
U.S. Cl. 260—561 N **9 Claims**

1. A process for making a copper catalyst comprising the steps of

a. firstly contacting particles of a metal alloy comprised of copper and aluminum in a weight ratio from about 70:30 to 30:70 copper to aluminum, said particles ranging in size from about 0.001 to 0.5 inch, with an aqueous solution which has dissolved therin on a one hundred weight percent total by-product free solution basis from greater than 0 to about 50 weight percent of at least one mineral acid selected from the group consisting of sulphuric acid and hydrochloric acid for a time sufficient to remove from said particles at least about 5 weight percent of the aluminum initially present therein,

b. secondly contacting the so acid-treated particles with an aqueous solution which has dissolved therein on a 100 weight percent total by-product free solution basis from greater than 0 to about 50 weight percent of at least one base selected from the group consisting of alkali metal hydroxide, ammonium hydroxide, aliphatic amine, quaternary ammonium hydroxide, alkali metal carbonate and water having a pH ranging from about 5.5 to 7.5 for a time sufficient to remove from said so acid-treated particles at least about one weight percent aluminum, based on total weight of aluminum initially present in said particles.

4. A process for hydrolyzing an olefinic nitrile containg from 3 through 6 carbon atoms per molecule to the corresponding amide comprising the steps of

a. firstly contacting particles of a metal alloy comprised of copper and aluminum in a weight ratio from about 70:30 to 30:70 copper to aluminum, said particles ranging in size from about 0.001 to 0.5 inch, with an aqueous solution which has dissolved therein on a one hundred weight percent total byproduct free solution basis from greater than 0 to about 50 weight percent of at least one mineral acid selected from the group consisting of sulphuric acid and hydrochloric acid for a time sufficient to remove from said particles at least about 5 weight percent of the aluminum initially present therein,

b. secondly contacting the so acid-treated particles with an aqueous solution which has dissolved therein on a one hundred weight percent total byproduct free solution basis from greater than 0 to about 50 weight percent of at least one base selected from the group consisting of alkali metal hydroxide, ammonium hydroxide, aliphatic amine, quaternary ammonium hydroxide, alkali metal carbonate and water having a pH ranging from about 5.5 to to 7.5 for a time sufficient to remove from said so acid-treated particles at least about one weight percent aluminum, based on total weight of aluminum initially present in said particles,

c. washing the resulting product particles with water having a pH ranging from about 5.5 to 7.5 for a time at least sufficient to cause said wash water to have a pH ranging from about 5.5 to 7.5 and sufficient to remove from such product particles any non-metallic visible solids,

d. thirdly contacting the so-washed particles with a composition comprising from about 10 to 75 weight percent acrylonitrile with the remainder up to one hundred weight percent thereof being water at a temperature

ranging from about 60° to 150°C for a time sufficient to convert at least some of said olefinic nitrile to the corresponding amide.

3,928,444
PROCESS FOR HYDROLYZING DICYAN

Sueo Kamada; Takeshi Yamashita; Tohru Ide; Ryogo Ajiki, and Takao Kitamura, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Nov. 25, 1974, Ser. No. 526,739

Claims priority, application Japan, Nov. 28, 1973, 48-132576; Dec. 11, 1973, 48-137314

Int. Cl.² C07C *103/08*

U.S. Cl. 260—561 K **12 Claims**

1. A process for preparing oxamide which comprises hydrolyzing dicyan in an aqueous solution containing as catalyst

a. one or more molybdates and/or tungstates, and

b. at least one metal ion selected from the group consisting of zinc, copper, nickel, cobalt, iron and manganese ions

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3,928,445
SYNTHESIS OF 2-HALO-5-CYANO ALKYL VALERATE

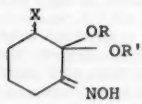
Milorad M. Rogic, and Frantisek Mares, both of Whippany, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,607

Int. Cl.² C07C *131/04*

U.S. Cl. 260—566 A **4 Claims**

1. A compound of the formula:



wherein X is a member of the group consisting of chlorine, bromine and iodine and R and R′ are independent alkyl groups having 1 to 12 carbon atoms.

3,928,446
PREPARATION OF 3-OXO-19-NOR-Δ⁴-STEROIDS FROM 10-[3-SUBSTITUTED-ALKYL]-DESASTEROIDS

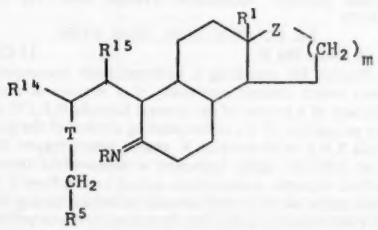
Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 11, 1974, Ser. No. 459,979

Int. Cl.² C07C *131/02*

U.S. Cl. 260—566 AE **8 Claims**

1. Compounds of the formula



wherein Z is carbonyl,>C=NR or a group of the formula

R^7 is hydrogen or lower alkanoyl or monocyclic aroyl; R^8 is hydrogen or lower aliphatic hydrocarbyl; *m* is an integer having a value of 1 or 2; R is lower alkoxy, hydroxy or a radical of the formula

wherein X and Y are each independently lower alkyl; R^1 is primary lower alkyl having from 1 to 5 carbons; R^5 is hydrogen or lower alkyl; R^{14} and R^{15} are each independently hyrogen or lower alkyl and T is carbonyl or a group of the formula

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3,928,447
SEPARATION AND PURIFICATION OF DIALKYLDIMETHYL AMMONIUM HALIDES

Ting P. Chen, Wappingers Falls, and Ronald E. Jones, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 22, 1974, Ser. No. 453,918

Int. Cl.² C07C *85/26*

U.S. Cl. 260—567.6 M **7 Claims**

1. A process for separating the purifying dialkyl dimethylammonium halides, each of said alkyl groups having about 10 to 24 carbon atoms, from amine hydrohalide-type contaminants, said products and said contaminants being present in the form of substantially anhydrous mixtures, comprising the steps of:

a. contacting said mixture with at least a solubilizing amount of lower alkanols containing less than 5% of water until both ammonium halide and amine hydrohalide-type contaminants are solubilized to produce a one-phase solution,

b. treating said solution with gaseous ammonia until substantially all of said contaminant is precipitated, and

c. separating the solubilized product contained therein.

3,928,448
DICHLOROBUTENE/DIMETHYLAMINE IONENE POLYMER

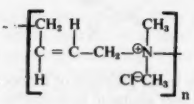
Edward G. Ballweber, Glenwood; Wun Ten Tai, Palos Hills, and Radhakrishnan Selvarajan, Chicago, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 15, 1974, Ser. No. 488,644

Int. Cl.² C07C *85/00, 87/30;* **C08F** *214/00;* **C02B** *1/20*

U.S. Cl. 260—567.6 P **5 Claims**

1. A trans-1,4-dichloro-2-butene-dimethylamine ionene chloride polymer with repeating units represented by the formula:



where *n* is sufficiently large to give a polymer with an intrinsic viscosity in the range of 0.04 to 0.85.

3,928,449

AMINOALKOXY-TERPHENYLS AND THE SALTS THEREOF

Rudolf G. Griot, Basel-Stadt, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

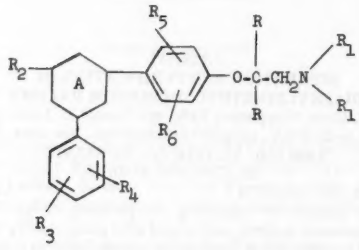
Division of Ser. No. 813,301, April 3, 1969, Pat. No. 3,622,588, which is a continuation-in-part of Ser. No. 725,172, April 29, 1968, abandoned. This application Mar. 3, 1971, Ser. No. 120,688

Int. Cl.² C07C *93/06*

U.S. Cl. 260—570.7 **10 Claims**

1. A compound from the group of

A. a compound of the formula:



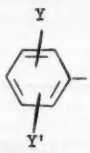
wherein

Ring A is a six-membered hydrocarbon ring having one double bond and a single hydroxy group pendent from said ring at a biphenyl position,

each of R is, independently, hydrogen or lower alkyl;

each of R_1 is, independently, lower alkyl;

R_2 is hydrogen, phenyl or substituted phenyl of the formula:



each of Y, Y′, R_3 and R_4 is, independently, hydrogen, halo of atomic weight not exceeding 80, lower alkyl, lower alkoxy, or phenyl, provided R_3 and R_4 are hydrogen when R_2 is hydrogen and provided R_3, R_4, Y and Y′ together represent no more than one phenyl and providing that R_3, R_4, Y and Y′ together represent no more than a total of two alkyl and alkoxy substituents, and

each of R_5 and R_6 is, independently, hydrogen or lower alkyl; and

B. acid addition salts of (A), above.

3,928,450

ACETYLENE SUBSTITUTED AROMATIC PRIMARY AMINES AND THE PROCESS OF MAKING THEM

Norman Bilow; Robert H. Boschan, both of Los Angeles, and Abraham L. Landis, Northridge, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 16, 1973, Ser. No. 416,709

Int. Cl.² C07C *93/14*

U.S. Cl. 260—571 **3 Claims**

1. A class of compounds comprised of the formula NH_2—R—C≡CH wherein R is phenoxy phenylene or phenylene thiophenylene.

3,928,451

METHOD OF PREPARING P-CHLOROPHENYLENEDIAMINE

Ram Murthy Krishnan, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 375,589, July 2, 1973, abandoned. This application Nov. 25, 1974, Ser. No. 526,763

Int. Cl.² C07C *85/11*

U.S. Cl. 260—580 **1 Claim**

1. A method of preparing p-chloro-m-phenylene diamine which consists essentially of hydrogenating 4-chloro-1,3-dinitrobenzene in a solution containing about 20 to about 30 percent 4-chloro-1,3-dinitrobenzene of an acetate solvent selected from at least one ethyl acetate, propyl acetate and butyl acetate at a pressure in the range of about 400 to about 1000 psig and at a temperature in the range of about 60° to about 120°C in the presence of about 1 to about 3 weight percent of a reduced platinum on granular carbon catalyst, based on the total solution, having a particle size in the range of about 200 to about 400 U.S. Standard mesh size containing essentially about 0.5 to about 1.5 weight percent platinum, said catalyst having a nitrobenzene number in the range of about 2600 to about 3200, said platinum on the granular carbon being reduced by at least about 99 percent to a zero valence state, and where said nitrobenzene number is the volume of hydrogen at standard temperature and pressure (STP) taken up over the first five minutes of reaction per gram of dry catalyst from the result of mixing 0.125 gram catalyst, 4.0 milliliters of nitrobenzene and 100.0 milliliters anhydrous methyl alcohol, where said mixture is shaken in a Parr apparatus under 300 millimeters mercury pressure.

3,928,452

PREPARATION OF MIXTURES OF KETONES AND OF THEIR CORRESPONDING ALCOHOLS

Jean Claude Brunie, Francheville-Le-Haut; Michel Costantini; Noel Crenne, both of Lyon, and Michel Jouffret, Francheville-le-Bas, all of France, assignors to Rhone-Poulenc S.A., Paris, France

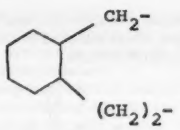
Filed Dec. 11, 1970, Ser. No. 97,375

Claims priority, application France, Dec. 12, 1969, 69.43179

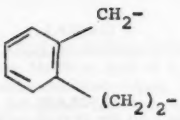
Int. Cl.² C07C *27/04, 29/00, 45/00*

U.S. Cl. 260—586 R **15 Claims**

1. Process for preparing a hydroperoxide decomposition product which consists essentially of a mixture of a major proportion of a ketone of the general formula R_1R_2CO and a minor proportion of the corresponding alcohol of the general formula R_1R_2CHOH in which R_1 and R_2, which may be identical or different, each represent a monovalent linear or branched aliphatic hydrocarbon radical having from 1 to 18 carbon atoms, an alicyclic hydrocarbon radical having from 3 to 16 carbon atoms in the ring, or a monocyclic or polycyclic aromatic hydrocarbon radical, or wherein R_1 and R_2 together form a divalent alkylene or alkenylene radical having from 4 to 15 carbon atoms or a radical of formula:



or



or wherein R_1 and R_2 are as defined above but is substituted by at least one fluoro, chloro, nitro or nitrile group by treating a secondary hydroperoxide of the general formula R_1R_2COOH where R_1 and R_2 are as defined above, at a reaction inducing temperature in the liquid phase with an aqueous solution of $CrCl_3.6H_2O$, CrO_3 or $VOCl_2$.

3,928,453

PROCESS FOR THE PREPARATION OF SUBSTITUTED CYCLOHEXADIENONES

John Halstead Atkinson, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

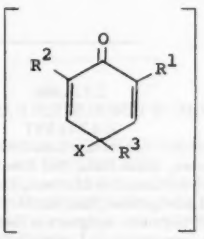
Filed Feb. 20, 1973, Ser. No. 334,107

Claims priority, application United Kingdom, Mar. 29, 1972, 14766/72

Int. Cl.² C07C *41/10, 45/00, 148/00*

U.S. Cl. 260—586 R **9 Claims**

1. A process for the production of a compound of the formula



in which:

X is sulphur or oxygen;

R^1 and R^2 are individually alkyl groups having 4 to 12 carbon atoms;

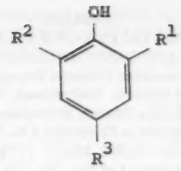
R^3 is a tertiary alkyl group having 4 to 8 carbon atoms;

R^4 is an acyclic hydrocarbon residue derived from a thiol or alcohol having from 1 to 10 carbon atoms; and

n is 1, 2, 3 or 4;

which comprises:

reacting a phenol of the formula



with an alcohol or thiol of the formula $R^4(XH)_n$, where R^1, R^2, R^3, R^4, X, and *n* are as defined above, with chlorine in the presence of a base selected from the group consisting of primary, secondary and tertiary alkylamines having 1 to 6 carbon atoms, alkali metal hydroxides, alkali metal lower alkoxides, alkali metal carbonates, alkaline earth metal carbonates, alkali metal bicarbonates, alkaline earth metal bicarbonates, and alkaline earth metal hydroxides.

3,928,454

BIS[2,6,6-TRIMETHYL-4-OXO-CYCLOHEXEN-1-YLIDENE]-3,7,12,16-TETRAMETHYL-2,6,8,10,12,16-OCTADECAHEXEN-4,14-DIYNE

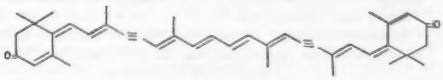
Joseph Donald Surmatis, and Armin Walser, both of West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 153,090, June 14, 1971, Pat. No. 3,830,844, which is a division of Ser. No. 826,022, May 19, 1969, Pat. No. 3,624,105, which is a division of Ser. No. 617,827, Feb. 23, 1967, Pat. No. 3,466,331. This application May 20, 1974, Ser. No. 471,268

Int. Cl.² C07C *49/48*

U.S. Cl. 260—586 R **1 Claim**

1. A compound of the formula:



3,928,455

(2,6,6-TRIMETHYL-4-OXO-CYCLOHEX-2-EN-1-YLIDENE)-6-HYDROXY-3-METHYL-7-METHYLENE-OCT-2-ENE-4-YNE

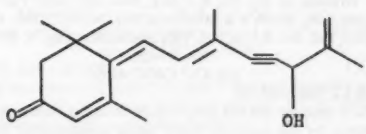
Joseph Donald Surmatis, and Armin Walser, both of West Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 153,090, June 14, 1971, Pat. No. 3,830,844, which is a division of Ser. No. 826,022, May 19, 1969, Pat. No. 3,577,407, which is a division of Ser. No. 617,827, Feb. 23, 1967, Pat. No. 3,466,331. This application May 20, 1974, Ser. No. 471,532

Int. Cl.² C07C *49/48*

U.S. Cl. 260—586 R **1 Claim**

1. A compound of the formula



3,928,456
CYCLOALIPHATIC UNSATURATED KETONES AS ODOUR- AND TASTE-MODIFYING AGENTS

Ervin Kovàts, Lausanne; Edouard Demole, Geneva; Gunther Ohloff, Bernex,Geneva, Switzerland, and Max Stoll, deceased, late of Lully, Geneva, Switzerland (by Suzanne Stoll, executrix), assignors to Firmenich S.A., Geneva, Switzerland

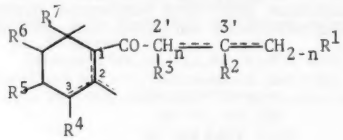
Division of Ser. No. 35,594, May 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 774,179, Nov. 7, 1968, abandoned. This application Sept. 6, 1974, Ser. No. 503,794

Claims priority, application Switzerland, Nov. 9, 1967, 15667/67; Nov. 1, 1968, 16309/68; May 7, 1969, 6976/69; Aug. 8, 1969, 12065/69; Apr. 14, 1970, 5559/70; Apr. 17, 1970, 5725/70

Int. Cl.² C07C *49/61*

U.S. Cl. 260—586 R **13 Claims**

1. Compounds having the formula



I

containing one double bond in position 2'- or 3'- of the acyl side-chain, and a double bond in position 1 or 2 of the cycle, the double bonds being represented by dotted lines, and wherein *n* is zero or 1, R^1, R^2 and R^3 represent hydrogen or one of them a lower alkyl radical and the others hydrogen, and R^4, R^5, R^6 and R^7 represent hydrogen or one of them a lower alkyl radical and the others hydrogen.

3,928,457
ACID CATALYZED, LIQUID PHASE PREPARATION OF METHYL VINYL KETONE

George Ember, Hackensack, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 296,407, Oct. 10, 1972, abandoned. This application Aug. 31, 1973, Ser. No. 393,519

Int. Cl.² C07C *49/20*

U.S. Cl. 260—593 R **5 Claims**

1. A process for obtaining methyl vinyl ketone comprising reacting at a temperature of from 100°C. to 300°C., a reaction mixture containing from about 5 to 20 parts by weight of acetone to 1 part by weight of formaldehyde and from about 0.01 to 0.5% by weight of the reaction mixture of a strong acid having a dissociation constant of 10^{-4} selected from the group consisting of sulfuric acid, an aliphatic, alicyclic or aromatic sulfonic acid, said reaction being carried out under a combination of temperatures and pressures sufficient to maintain the reaction mixture in a liquid phase.

3,928,458
SYNTHESIS OF ALPHA, BETA-UNSATURATED ESTERS, ALDEHYDES, KETONES AND NITRILES

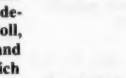
Hugh J. Hagemeyer, Jr.; Alden E. Blood, and Thomas C. Snapp, Jr., all of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 877,561, Nov. 21, 1969, Pat. No. 3,845,106, which is a division of Ser. No. 677,393, Oct. 23, 1967, Pat. No. 3,574,703. This application Aug. 5, 1974, Ser. No. 494,594

Int. Cl.² C07C *45/00*

U.S. Cl. 260—593 R **5 Claims**

1. A process for the preparation of alpha,beta-unsaturated ketones by the catalytic vapor phase condensation of a mixture of formaldehyde and a ketone, said ketone possessing at least two hydrogen atoms attached to the alpha carbon atom and having the general formula



wherein R is hydrogen or alkyl of 1 to 6 carbon atoms and R′ is an alkyl group of 1 to 6 carbon atoms, in the presence of a catalyst consisting essentially of silica gel having a pore volume greater than 0.30 cc/g. and a surface area less than 600 m^2/g.

3,928,459
PROCESS FOR SPLITTING ACETALS AND HEMIACETALS

Jules Mercier, Melle, France, assignor to Rhone-Poulenc Industries, Paris, France

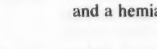
Filed Feb. 28, 1968, Ser. No. 708,775

Claims priority, application France, Mar. 29, 1967, 67.100671

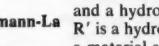
Int. Cl.² C07C *45/00*

U.S. Cl. 260—601 R **10 Claims**

1. A process for splitting acetals and hemiacetals which comprises passing a homogeneous liquid reaction mixture comprising a compound selected from the group consisting of an acetal having the formula:



and a hemiacetal having the formula:



wherein R is selected from the group consisting of hydrogen and a hydrocarbon group containing 1–12 carbon atoms and R′ is a hydrocarbon group containing 1–12 carbon atoms and a material selected from the group consisting of water and a mixture of alkanol and water, wherein the water constitutes between 5–30% by weight of the reaction mixture, upwardly through a fluidized catalyst, said catalyst being a sulfonic ion exchange resin in acid form, at a temperature of 60° to 140°C. and a pressure sufficient to maintain the reaction mixture in the liquid phase.

3,928,460
PRODUCTION OF COMBUSTION GAS TO HEAT SILVER CATALYST

Albrecht Aicher, Frankenthal; Hans Diem; Hans Haas, both of Ludwigshafen; Klaus Hess, Bad Duerkheim; Oskar Hussy, Ludwigshafen; Guenther Matthias, Ludwigshafen; Heinrich Sperber, Ludwigshafen, and Richard Stickel, Bad Duerkheim, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 14. 1973. Ser. No. 360,076

Claims priority, application Germany, May 18, 1972, 2224223

Int. Cl.² C07C *45/16*; B01J *23/48*

U.S. Cl. 260—603 C **5 Claims**

1. In a process for heating up a silver catalyst in the catalytic syntheses of formaldehyde from methanol and oxygen, the improvement of producing a combustion gas of 400° to 1300°C. used to initially heat said catalyst which comprises:

mixing (a) a starting gas mixture consisting essentially of methanol and from 1 to 10 percent by weight of oxygen based on methanol having a flow velocity of from 50 to

500 meters per second with (b) oxygen having a flow velocity of from 1 to 20 meters per second in a ratio of from 10 to 80 percent by weight of additional oxygen based on the starting mixture;

igniting the resulting final mixture consisting essentially of methanol and oxygen and burning only from 85 to 99 percent by weight of the total amount of methanol in the flame formed; and

heating said silver catalyst with the combustion gas formed by the burned mixture.

3,928,461
PRODUCTION OF FORMALDEHYDE

Hans Diem; Guenther Matthias, both of Ludwigshafen; Albrecht Aicher, Frankenthal-Studernheim; Hans Haas, Ludwigshafen; Hans Schreiber, Ludwigshafen, and Heinrich Sperber, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 21, 1973, Ser. No. 372,257

Claims priority, application Germany, June 26, 1972, 2231248

Int. Cl.² C07C *45/15*

U.S. Cl. 260—603 HF **13 Claims**

1. A process for producing formaldehyde by oxidizing dehydrogenation of methanol in the presence of a silver catalyst at elevated temperatures, wherein the reaction is carried out at a temperature of 550° to 750°C and during the reaction an additional vapor mixture heated to at least 70°C and consisting of 0.05 to 0.8 mole of water and 0.005 to 0.6 mole of oxygen based on 1 mole of feed methanol is introduced, into the vaporous methanolic starting mixture which has been heated to at least 60°C and contains water in a molar ratio of 0.09 to 1.8 and oxygen in a molar ratio of 0.35 to 0.5, based on 1 mole of methanol, before said starting mixture enters the catalyst bed, the space velocity being 0.9 to 3 metric tons of methanol, calculated 100%, per square meter of catalyst bed cross-section per hour, said reaction being carried out in a plurality of reactors arranged in parallel, each reactor having a bed of said silver catalyst of a diameter of at least 0.5 meters, said starting mixture being fed to the respective reactors via a branch line connecting each respective reactor with a main supply pipe for said starting mixture, and said additional vapor mixture being fed into at least one of said reactors at a point ahead of the entry of said starting mixture into said catalyst bed.

3,928,462
CATALYTIC PROCESS FOR THE PREPARATION OF METHACROLEIN

Tatsuo Shiraishi; Susumu Kishiwada; Shinkichi Shimizu; Shigeru Honmaru; Hiroshi Ichihashi, and Yoshihiko Nagaoka, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed July 2, 1971, Ser. No. 159,307

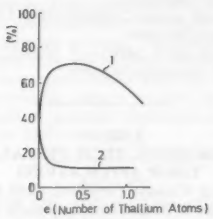
Int. Cl.² C07C *45/04*

U.S. Cl. 260—604 R **19 Claims**

1. A process for the preparation of methacrolein by the vapor phase oxidation of isobutylene which comprises contacting isobutylene and oxygen at a temperature from 250° to 500°C. with a catalyst composition consisting essentially of a catalyst system of the formula:

$$Mo_aBi_bFe_cNi_dTl_eX_fP_gO_h$$

wherein X is Mn, Mg or Co or a combination thereof and *a*, *b*, *c*, *d*, *e*, *f*, *g* and *h* represent respectively the number of atoms wherein *a* is 12, *b* is 0.1 to 5, *c* is 0.1 to 5, *d* is 0.1 to 12, *e* is



1 or less but not 0, *f* is 0 to 12, *g* is 0 to 5 and *h* is from 36 to 89.

3,928,463
PROCESS FOR THE PREPARATION OF TERTIARY METHYL-PHOSPHINE OXIDES

Martin Reuter, Kronberg, Taunus, and Walter Rupp, Konigstein, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 11, 1974, Ser. No. 460,133

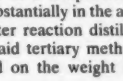
Claims priority, application Germany, May 24, 1974, 2357279

Int. Cl.² C07D *105/02*

U.S. Cl. 260—606.5 P **13 Claims**

1. A process for the preparation of tertiary methyl phosphine oxide of the formula

wherein R_1 is alkyl having up to 20 carbon atoms or alkyl having up to 20 carbon atoms and substituted by a group inert under conditions of the process, and R_2 is alkyl having up to 20 carbon atoms or alkyl having up to 20 carbon atoms and substituted by a group inert under conditions of the process or $-CH_2OH$, which comprises contacting a hydroxymethyl-alkyl phosphine of the formula



with at least about 1% by weight of carbon tetrachloride or carbon tetrabromide at a temperature between about −10° and about 120°C. substantially in the absence of oxygen, water and alcohol, and after reaction distilling off the carbon tetrahalide to isolate said tertiary methyl-phosphine oxide, the percent being based on the weight of said hydroxymethyl-alkyl-phosphine.

3,928,464
ORGANIC PEROXIDES, THEIR PREPARATION, AND THEIR APPLICATIONS

Egeo Sacrini, and Claudio Cavallotti, both of Milan, Italy, assignors to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 373,934, June 27, 1973, which is a division of Ser. No. 62,128, Aug. 7, 1970, Pat. No. 3,775,465. This application Apr. 23, 1975, Ser. No. 570,601

Claims priority, application Italy, Aug. 12, 1969, 20839/69

Int. Cl.² C07C *179/06*

U.S. Cl. 260—610 R **1 Claim**

1. A tetraperoxide selected from the group consisting of

1. α-α′ (2-tert.-butyl-peroxy-2-phenyl ethyl-2-idene-2-peroxy) 1,3 diisopropylbenzene;

2. α-α′ (2-tert.-butyl-peroxy-2-phenyl ethyl-2-idene-2-peroxy) 1,4 diisopropylbenzene;
3. α-α′ (2-cumyl peroxy-2-phenyl ethyl-2-idene-2-peroxy) 1,3 diisopropylbenzene;
4. α-α′ (2-cumyl peroxy-2-phenyl ethyl-2-idene-2-peroxy) 1,4 diisopropylbenzene;
5. α-α′ [2-tert.-butyl peroxy-(3 phenyl) propylidene-2-peroxy] 1,3 diisopropylbenzene.

3,928,465

ORGANIC PEROXIDES, THEIR PREPARATION, AND THEIR APPLICATIONS

Egeo Sacrini, and Claudio Cavallotti, both of Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

Division of Ser. No. 62,128, Aug. 7, 1970, Pat. No. 3,775,465. This application June 27, 1973, Ser. No. 373,934

Int. Cl.² C07C *179/00*

U.S. Cl. 260—610 R **5 Claims**

1. A tetraperoxide selected from the group consisting of

1. α-α′ (2-cumyl peroxy-isopropylidene-2-peroxy) 1,3 diisopropylbenzene;
2. α-α′ (2-cumyl peroxy-isopropylidene-2-peroxy) 1,4 diisopropylbenzene;
3. α-α′ (2-tert.-butyl peroxy-n-butylidene-2-peroxy) 1,3 diisopropylbenzene;
4. α-α′ (4-tert.-butyl peroxy-2,6,8 trimethyl nonylidene-4-peroxy) 1,3 diisopropylbenzene.

3,928,466

ORGANIC PEROXIDES DERIVED FROM UNSATURATED COMPOUNDS

Egeo Sacrini, and Claudio Cavallotti, both of Milan, Italy, assignors to The B. F. Goodrich Company, Akron, Ohio

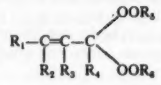
Division of Ser. No. 53,267, July 8, 1970. This application Mar. 3, 1975, Ser. No. 554,474

Claims priority, application Italy, July 29, 1969, 20222/69

Int. Cl.² C07C *179/00*, *179/06*

U.S. Cl. 260—610 R **7 Claims**

1. An organic peroxide having the formula:



wherein R_1 is selected from the group consisting of alkyl and cycloalkyl radicals having 5–30 carbon atoms; and alkyl and hydroxy substituted phenyl radicals having 6–26 carbon atoms; R_2 is selected from the group consisting of hydrogen, alkyl and cycloalkyl radicals having 5–20 carbon atoms; alkyl radicals having 1–12 carbon atoms, and alkyl substituted phenyl radicals; and R_1 and R_2 together with the carbon atom to which they are bonded may form a cycloaliphatic ring selected from the group consisting of alkyl, phenyl, phenylalkyl, alkylidene and phenylalkylidene substituted cycloaliphatic rings having 5–30 carbon atoms; R_3 and R_4 are each selected from the group consisting of hydrogen, alkyl and cycloalkyl radicals having 5–20 carbon atoms; alkyl substituted phenyl radicals having 6–20 carbon atoms; alkyl radicals having 1–12 carbon atoms, and phenylalkyl radicals having 7–20 carbon atoms and R_3 and R_4 taken together with the two adjacent carbon atoms to which they are respectively bonded may form a cycloaliphatic ring selected from the group consisting of alkyl, phenyl, phenylalkyl, alkylidene, phenylalkylidene and hydroxyphenylalkylidene substituted cycloaliphatic rings having 5–25 carbon atoms; R_5 and R_6 are each selected from the group consisting of alkyl cycloalkyl radicals having 5–21 carbon atoms; alkyl substituted phenylcycloalkyl radicals having 9–25 carbon atoms; alkyl radicals having 4–12 carbon atoms, and phenylalkyl radicals having 9–18 carbon atoms.

3,928,467

ORGANIC PEROXIDES, THEIR PREPARATION AND THEIR APPLICATIONS

Egeo Sacrini, and Claudio Cavallotti, both of Milan, Italy, assignors to The B.F. Goodrich Company, Akron, Ohio

Division of Ser. No. 373,934, June 27, 1973, which is a division of Ser. No. 62,128, Aug. 7, 1970, Pat. No. 3,775,465. This application Apr. 23, 1975, Ser. No. 570,600

Claims priority, application Italy, Aug. 12, 1969, 20839/69

Int. Cl.² C07C *179/06*

U.S. Cl. 260—610 R **1 Claim**

1. A tetraperoxide selected from the group consisting of

1. α-α′ (1-tert.-butyl peroxy-cyclopentylidene-1-peroxy) 1,3 diisopropylbenzene;
2. α-α′ (1-tert.-butyl peroxy-cyclopentylidene-1-peroxy) 1,4 diisopropylbenzene;
3. α-α′ (1-cumyl peroxy-cyclopentylidene-1-peroxy) 1,3 diisopropylbenzene;
4. α-α′ (1-cumyl peroxy-cyclopentylidene-1-peroxy) 1,4 diisopropylbenzene;
5. α-α′ (1-tert.-butyl peroxy-cyclohexylidene-1-peroxy) 1,3 diisopropylbenzene;
6. α-α′ (1-tert.-butyl peroxy-cyclohexylidene-1-peroxy) 1,4 diisopropylbenzene;
7. α-α′ (1-cumyl peroxy-cyclohexylidene-1-peroxy) 1,3 diisopropylbenzene;
8. α-α′ (1-cumyl peroxy-cyclohexylidene-1-peroxy) 1,4 diisopropylbenzene;
9. α-α′ (1-tert.-butyl peroxy-4 tert.-butyl-cyclohexylidene-1-peroxy) 1,3 diisopropylbenzene;
10. α-α′ (1-tert.-butyl peroxy-4 tert.-butyl-cyclohexylidene-1-peroxy) 1,4 diisopropylbenzene;
11. α-α′ (1-tert.-butyl peroxy-cyclododecylidene-1-peroxy) 1,3 diisopropylbenzene;
12. α-α′ (1-tert.-butyl peroxy-cyclododecylidene-1-peroxy) 1,4 diisopropylbenzene;
13. α-α′ [1-cumyl-peroxy-(4-tert.-butyl) cyclohexylidene-1-peroxy] 1,3 diisopropylbenzene.

3,928,468

HALOGENATED METHYLCYCLOPROPYL ETHERS

Charles Alden Billings, Concord; Gerald Joseph O'Neill, Arlington, and Charles William Simons, Bedford, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Division of Ser. No. 451,677, March 15, 1974. This application Dec. 5, 1974, Ser. No. 529,631

Int. Cl.² C07C *43/18*

U.S. Cl. 260—611 R **1 Claim**

1. The methyl cyclopropyl ethers of the class consisting of 1-methoxy-1,2,2,3-tetrafluoro-3-chlorocyclopropane, 1-methoxy-1,2,3-trifluoro-2,3-dichlorocyclopropane, 1-methoxy-1,2,2-trifluoro-3,3-dichlorocyclopropane and 1-methoxy-1,2,2,3-tetrafluoro-3-bromocyclopropane.

3,928,469

PROCESS FOR THE CLEAVAGE OF HYDROPEROXIDES

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Hidekazu Fujino, Moriguchi; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Kazunari Ehara, Takarazuka; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai, and Minoru Yasuda, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 21, 1973, Ser. No. 362,212

Claims priority, application Japan, May 23, 1972, 47-51398

Int. Cl.² C07C *39/08*

U.S. Cl. 260—621 C **5 Claims**

1. In a process for the cleavage of diisopropylbenzene dihydroperoxide which comprises heating an oxidation product of diisopropylbenzene containing m-diisopropylbenzene dihydroperoxide in an organic solvent selected from the group consisting of alcohols, ketones and alkyl benzenes in the presence of an acidic catalyst, the improvement comprising incor-

porating p-diisopropylbenzene dihydroperoxide in the material to be cleaved in an amount of from 5% to 80% by weight based on m-diisopropylbenzene dihydroperoxide to thereby improve the yield of resorcin from m-diisopropylbenzene.

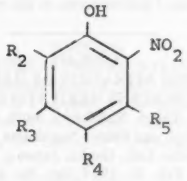
3,928,470

PREPARATION OF 2-NITROHALOPHENOLS

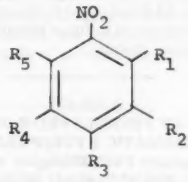
Gerard Soula, Meyzieu; Jacques Metzger, and Louis Lena, both of Marseille, all of France, assignors to Rhone-Progil, Courbevoie, France

Filed Apr. 1, 1974, Ser. No. 456,881
Claims priority, application France, Apr. 6, 1973, 73.13606
Int. Cl.² C07C *79/26*
U.S. Cl. 260—622 R **14 Claims**

1. In a process for the preparation of the 2-nitrohalophenols having the structural formula:



comprising reacting a polyhalonitrobenzene having the structural formula:



with a dehalohydroxylation agent, wherein the above formulae R_1 is halogen; R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, halogen and lower alkyl having from one to four carbon atoms; and R_5 is selected from the group consisting of hydrogen and lower alkyl having from one to four carbon atoms; with the proviso that at least one of R_2, R_3 and R_4 must be halogen; and wherein the halogen is selected from the group consisting of chlorine, fluorine and bromine, the improvement comprising conducting said reaction in an ortho orienting liquid organic reaction medium comprising a tertiary alcohol having a dielectric constant not in excess of 25 determined at approximately 25°C.

3,928,471

METHOD FOR THE SEPARATION OF 5-ISOPROPYL-M-RESOL

Hideaki Suda, Takaishi; Norio Kotera, Amagasaki, and Shinichi Hasegawa, Settsu, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Aug. 9, 1973, Ser. No. 387,167
Claims priority, application Japan, Aug. 9, 1972, 47-80171; Aug. 9, 1972, 47-80174
Int. Cl.² C07C *37/44, 39/06*
U.S. Cl. 260—627 G **5 Claims**

1. A method for the separation of 5-isopropyl-m-cresol from a mixture of isopropylated cresols containing 5-isopropyl-m-cresol, 4-isopropyl-m-cresol, 3-isopropyl-p-cresol, and 2,6-diisopropyl-m- and p-cresols, which comprises reacting the mixture with an alkylating agent selected from the group consisting of monoolefins having from 4 to 12 carbon atoms, at a temperature of 0° to 300°C. under a pressure of atmospheric to 10 kg/cm² in the presence of at least one catalyzer selected from the group consisting of hydrogen fluoride, sulfuric acid, phosphoric acid, perchloric acid, p-toluenesulfonic acid, aluminum chloride, boron trifluoride, ferric chloride, zinc chloride, titanium chloride, alumino-silicate, terra alba and sulfonic acid type ion exchange resins, and recovering unalkylated 5-isopropyl-m-cresol from the resulting mixture by an alkali extraction using 1 to 30% by weight aqueous sodium hydroxide or potassium hydroxide solution at a temperature of 0° to 100°C.

3,928,472

PROCESS FOR THE PRODUCTION OF INDANOL-(4) AND INDANOL-(5)

Heinrich Miele, Weinheim, Bergstr; Winfried Orth, Hassloch, Pfalz, and Emmerich Pastorek, Mannheim, all of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 14, 1973, Ser. No. 332,476
Claims priority, application Germany, Feb. 22, 1972, 22082537
Int. Cl.² C07C *37/04*
U.S. Cl. 260—628 **9 Claims**

1. A process for the production of indanol-(4) or indanol-(5), said process comprising adding an alkali metal salt, alkaline earth metal salt or ammoniuim salt of indan-4- or indan-5-sulfonic acid to potassium hydroxide and at least one alkali metal salt of a second acid selected from the group consisting of C_1–C_8 aliphatic monocarboxylic acids, C_1–C_8 aliphatic polycarboxylic acids, hydroxy-substituted C_1–C_8 aliphatic monocarboxylic or polycarboxylic acids and alkoxy substituted C_1–C_8 aliphatic monocarboxylic or polycarboxylic acids, said alkoxy group having 1–4 carbon atoms, while heating and agitating the resulting mixture at a temperature of about 250°–300°C to form a melt, stirring said melt for another four hours after all of said sulfonate has been added, and recovering said indanol-(4) or indanol-(5) from said melt, wherein said sulfonic acid salt, said potassium hydroxide and said salt of said second acid are in a molar ratio of about 1:3–25:0.1–2.

3,928,473

OSMIUM CATALYZED OXIDATION OF OLEFINIC COMPOUNDS

Harold Shalit, Drexel Hill, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 11, 1974, Ser. No. 449,889
Int. Cl.² C07C *27/10, 29/02*
U.S. Cl. 260—635 H **9 Claims**

1. In the method for the oxidation of monoolefinic compounds having from 2 to 4 carbon atoms in the molecule and selected from the group consisting of ethylene, propylene, allyl alcohol and butylenes at a temperature in the range from 60°C. to 220°C. and a pressure of from 1 atmosphere to 10,000 psig with molecular oxygen in the presence of an octavalent osmium catalyst in aqueous solution to produce the corresponding glycol, the improvement comprising adding from 1 weight percent to 50 weight percent of an alkali metal borate based on the aqueous solution.

3,928,474

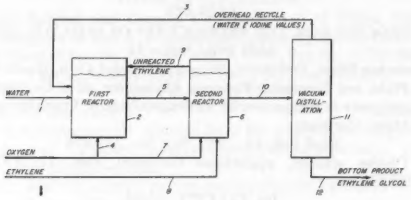
MANUFACTURE OF GLYCOLS

John Maurice Witheford, Wyckoff, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 273,586, July 20, 1972, abandoned. This application June 21, 1974, Ser. No. 483,842
Int. Cl.² C07C *29/02*
U.S. Cl. 260—635 H **2 Claims**

1. In a process for preparing ethylene glycol which comprises bringing into reactive combination ethylene, water and oxygen in substantially stoichiometric amounts in at least two

reaction zones maintained at an elevated temperature and under superatmospheric pressure in the presence of an aqueous iodine-containing catalyst for said reaction, distilling the latter reaction mixture and recovering ethylene glycol from said reaction mixture, the improvement which comprises the steps of: adding from about 0.350 to 0.490 mole of oxygen and an aqueous solution of a catalytic iodine-containing compound selected from the group consisting of iodine, hydrogen iodide, ethylene diiodide, iodoethanol and mixtures thereof dissolved in at least 1 mole of water to a first reaction zone, introducing about 1 mole of ethylene and about 0.010 to 0.150 mole of oxygen to a second reaction zone, the amount



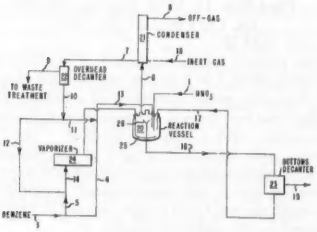
of oxygen in both zones being equal to about 0.5 mole, withdrawing unreacted ethylene from the second reaction from overheads and introducing the same into the said first reaction zone, withdrawing from the first reaction zone a mixture of relatively high boiling organic iodides, iodine and ethylene glycol, introducing the latter mixture into said second reaction zone while maintaining said reaction zones at temperatures ranging from between 75°C. and 175°C. and pressure ranging from between 50 psi. and 1,000 psi. in each of said reaction zones, withdrawing a mixture of low boiling iodides and ethylene glycol as bottoms from the second reaction zone, subjecting the latter to distillation under a subatmospheric pressure at a bottoms temperature of from 50°C. to 190°C.

3,928,475

AZEOTROPIC NITRATION OF BENZENE

Mark W. Dassel, Alloway, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Aug. 9, 1974, Ser. No. 497,047
Int. Cl.² C07C *79/10*
U.S. Cl. 260—645 **13 Claims**



1. A continuous process for the mononitration of benzene comprising the steps of

feeding fresh benzene and nitric acid in about stoichiometric proportions to produce nitrobenzene into a reaction vessel containing nitrobenzene, benzene and sulfuric acid;

mixing the ingredients in the reaction vessel and reacting benzene and nitric acid at a temperature in the range of about 120° to 160°C.;

vaporizing an azeotrope of a water phase containing nitric acid and a hydrocarbon phase containing benzene and nitrobenzene, and removing the azeotrope from the reaction vessel;

condensing the azeotrope, separating the aqueous phase from the hydrocarbon phase,

feeding excess benzene into the reaction vessel to maintain the total input of benzene to the reaction vessel above stoichiometric relative to the nitric acid fed thereto and to enhance the vaporization of the azeotrope, said excess benzene being either recycle stream of the hydrocarbon phase from the condensed azeotrope, or fresh benzene, or a combination of both; and

withdrawing from the reaction vessel a mixture of acids and nitrobenzene, separating the nitrobenzene as product, and recycling the acids to the reaction vessel;

with the sulfuric acid concentration in the reaction vessel being controlled within the range of 55 to 70 percent by weight relative to the sulfuric acid plus water present by adjusting one or more of the reaction temperatures and the rates of feeding nitric acid and benzene to the reaction vessel.

3,928,476

PROCESS FOR NITRATION OF HALOGENATED BENZENE DERIVATIVES

Keizo Shimada; Takeo Nishikawa, both of Hino; Toshiaki Harada, Hachioji, and Shizuo Nagahama, Hino, all of Japan, assignors to Teitin Ltd., Osaka, Japan

Filed Feb. 20, 1974, Ser. No. 444,158
Claims priority, application Japan, Feb. 26, 1973, 48-22255
Int. Cl.² C07C *79/12*
U.S. Cl. 260—646 **6 Claims**

1. A process for nitrating halogenated benzene derivatives, which comprises reacting a halogenated benzene derivative with nitric acid in the liquid phase in the presence of a catalyst composed of an oxyacid of sulfur or phosphorus supported on silica-alumina and/or alumina.

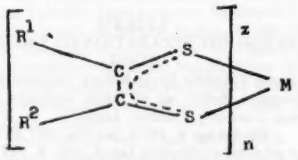
3,928,477

PRODUCTION OF PHENOLS FROM DECOMPOSITION OF AROMATIC HYDROPEROXIDES

Peter Graham Spencer Field, Bebington, and David Anthony Lock, Heswall, both of England, assignors to Burmah Oil Trading Limited, Swindon, England

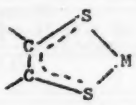
Filed Nov. 8, 1973, Ser. No. 413,967
Claims priority, application United Kingdom, Nov. 8, 1972, 51630/72
Int. Cl.² C07C *37/08*
U.S. Cl. 260—621 C **21 Claims**

1. A process for producing a phenol or a substituted phenol by decomposing an aromatic hydroperoxide, which process comprises effecting the decomposition at a temperature in the range from ambient temperature to 180°C. in the presence of from 0.00001 to 0.5 mole percent, based on the amount of the hydroperoxide of a catalyst comprising a metal complex represented by the formula:



wherein *n* is 1, 2 or 3; M is a metal of the transition series capable of forming a complex in which it has a coordination number of at least 2; *z* represents the formal chanrge on the complex and is 0, −1 or −2; and R^1 and R^2, which may be the same or different, represent hydrocarbyl groups containing up

to 12 carbon atoms which may be unsubstituted, substituted by one or more halogen atoms, alkoxy groups containing up to 6 carbon atoms or atoms providing a grouping:



or, together with the carbon atoms to which they are attached, form an alicyclic ring, and recovering the required phenol or substituted phenol from the decomposition products.

3,928,478

CHLORINATION OF XYLENE

Thomas Albert Johnson, Newark, Del., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jan. 17, 1974, Ser. No. 434,021

Int. Cl.² C07C *25/14*, *25/125*

U.S. Cl. 260—651 R **4 Claims**

1. In a process for preparing α, α′, 2, 3, 5, 6-hexachloro-p-xylene by admixing p-xylene or its ring-chlorinated derivatives and a solvent; incrementally adding thereto about from 7 to 10 moles of chlorine gas at a temperature of about from 60° to 120°C. in the presence of at least about 1%, by weight of the p-exylene, of Lewis acid catalyst, over a period of about from 10 to 20 hours; separating the catalyst from the reaction mass and isolating the product, the improvement wherein the solvent consists essentially of perchloroethylene.

3,928,479

PROCESS FOR THE MANUFACTURE OF CARBON TETRACHLORIDE

Wilhelm Riemenschneider, Frankfurt am Main, Germany; Lothar Heinz Hornig, deceased, late of Frankfurt am Main-Schwanheim, Germany; by Anneliese Hornig nee Munich, co-heiress, Frankfurt am Main, Germany; Helmut Meidert, Frankfurt am Main, Germany, and Hans Krekeler, Wiesbaden, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 21, 1970, Ser. No. 4,747

Claims priority, application Germany, Jan. 30, 1969, 1904425

Int. Cl. C07c *17/00*

U.S. Cl. 260—658 R **3 Claims**

1. In a process for a continuous manufacture of carbon tetrachloride by the reaction of benzene, a mixture of benzene and chloro-substituted aromatic hydrocarbons or a mixture of benzene and chloro-substituted aliphatic hydrocarbons with chlorine in absence of catalysts at a pressure above 20 atmospheres gauge in a prereaction zone at a temperature in the range of from 100° up to 350°C whereby chlorinated products are formed in said prereaction zone and in a main reaction zone at the same pressure and at a temperature in the range of from 350° to 800°C in the gaseous phase, the improvement of which consists essentially of introducing into the prereaction zone liquid hexachlorobenzene at a temperature of at least 227°C prior to the beginning of the reaction, maintaining said temperature of at least 227°C until the admixture of chlorine and partially chlorinated hydrocarbons reduces the melting temperature of hexachlrobenzene and continuously passing into said main reaction zone products from said prereaction zone and entrained hexachlorobenzene.

3,928,480

PROCESS OF PRODUCING ALKYL ADAMANTANES

Iwao Tabushi, Fukuoka, and Koji Fukunishi, Kyoto, both of Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 527,049

Int. Cl.² C07C *13/28*

U.S. Cl. 260—666 M **16 Claims**

1. A process of producing an alkyl adamantane which comprises reacting an adamantane compound with an olefin in the presence of a free radical initiator.

3,928,481

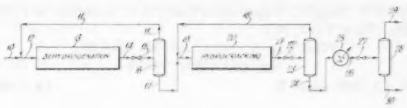
PREPARATION OF POLYPHENYLS

Robert M. Suggitt, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed July 5, 1974, Ser. No. 485,860

Int. Cl.² C07C *15/14*

U.S. Cl. 260—668 D **18 Claims**



11. The method which comprises

dehydrogenating a naphthenyl benzene in a non-oxidative atmosphere at dehydrogenation conditions in the presence of non-acidic dehydrogenation catalyst thereby forming a dehydrogenated stream containing (i) desired aromatic components and (ii) undesired components having a naphthenyl-aromatic bond;

cracking said dehydrogenated stream at cracking conditions thereby rupturing at least a portion of said naphthenyl-aromatic bonds and forming lower boiling products;

separating said lower boiling products; and

recovering said desired aromatic components.

3,928,482

PROCESS FOR CONVERSION OF ALKYLDECALINS AND/OR ALKYLTETRALINS

John A. Hedge, Wilmington, Del.; George Suld, Springfield, and Ralph L. Urban, Newtown Square, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Filed Apr. 8, 1974, Ser. No. 458,962

Int. Cl.² C07C *5/24*, *15/20*

U.S. Cl. 260—668 F **12 Claims**

1. A process for conversion of a feed consisting essentially of an alkyldecalin or an alkyltetralin or a non-equilibrium mixture thereof, said process comprising contacting said feed under conversion conditions with an aluminosilicate zeolite containing polyvalent metal cations in exchange positions, said contacting being at a temperature in the range of 100°C to 350°C, at a liquid hourly space velocity in the range of 0.25 to 10, and at a pressure in the range of 15 to 1500 psig.

3,928,483

PRODUCTION OF GASOLINE HYDROCARBONS

Clarence Dayton Chang, Princeton, N.J.; Anthony John Silvestri, Morrisville, Pa., and Robert Lloyd Smith, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 23, 1974, Ser. No. 508,112

Int. Cl.² C10G *37/06* B01J *29/28*

U.S. Cl. 260—668 R **13 Claims**

1. A method for controlling the exothermic reactions of feed mixtures comprising C_1 to C_3 alcohols and ethers to form gasoline boiling range products which comprises,

contacting a feed comprising methanol with a condensation catalyst under controlled exothermic reaction temperature conditions promoting the formation of water and an

aliphatic organic intermediate product comprising ethers and olefins,

separating water from said aliphatic organic intermediate product,

contacting at least the aliphatic organic intermediate product with a crystalline zeolite aromatizing catalyst under aromatizing conditions, said crystalline zeolite chracterized by a pore dimension greater than 5 Angstroms, a silica/alumina ratio greater than 12, and a constraint index within the range of 1 to 12, and

restricting aromatization of organic components in the intermediate product under exothermic generating temperature conditions promoting the formation of gasoline boiling range aromatics to the substantial exclusion of a durene product.

3,928,484

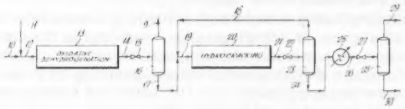
PRODUCTION OF AROMATIC COMPOUNDS BY OXIDATIVE DEHYDROGENATION

Robert M. Suggitt, Wappingers Falls, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed July 5, 1974, Ser. No. 485,861

Int. Cl.² C07C *15/14*

U.S. Cl. 260—668 D **18 Claims**



18. The method which comprises

oxidatively dehydrogenating a charge stream containing dicyclohexyl benzene in an oxidative atmosphere at oxidative dehydrogenation conditions including pressure of 4–300 psia and temperature of 700°F–1100°F in the presence of a oxidative dehydrogenation catalyst including copper chromite containing barium thereby forming an oxidatively dehydrogenated stream containing (i) desired terphenyl and (ii) undesired components having a cyclohexyl-aromatic bond;

hydrocracking said oxidatively dehydrogenated stream at cracking conditions including temperature of 500°F–900°F and 0–2000 psig in the presence of an acidic catalyst thereby rupturing at least a portion of said cyclohexyl-aromatic bonds and forming lower boiling products;

separating said lower boiling products; and

recovering said desired terphenyl.

3,928,485

ISOMERIZATION OF OLEFINS

Tsuneyuki Nagase; Gohu Suzukamo, and Masami Fukao, all of Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Japan

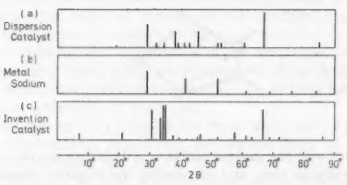
Continuation of Ser. No. 164,151, July 21, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,948

Claims priority, application Japan, July 23, 1970, 45-64625; Sept. 5, 1970, 45-78006; Feb. 2, 1971, 46-4146

Int. Cl.² C07C *5/30*

U.S. Cl. 260—680 R **15 Claims**

1. A method for isomerization of olefins which comprises contacting a linear, isomerizable olefinic hydrocarbon with a catalyst to give the corresponding linear, isomerizable olefinic hydrocarbon, the said catalyst being prepared by heating alumina, from 0.01 to 100 percent by weight of the alumina of an alkali metal hydroxide, and from 0.01 molar to an equimolar amount with respect to the alkali metal hydroxide of an alkali metal at a temperature higher than the melting point of the alkali metal to give a catalyst composition which does not contain metallic alkali metal and consequently does not ignite



on exposure to air and does not generate hydrogen on admixture with water.

3,928,486

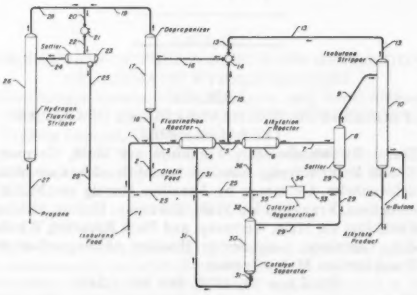
ALKYLATION PROCESS WITH FLUORINATION STEP UTILIZING HF CATALYST AND HYDROCARBON POLYMER

Jay E. Sobel, Highland Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 366,832, June 4, 1973, which is a continuation-in-part of Ser. No. 190,020, Oct. 18, 1971, abandoned. This application Apr. 8, 1974, Ser. No. 458,639The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.49 **9 Claims**



1. A process for producing an alkylation reaction product from a lower molecular weight mono-olefin and a lower molecular weight isoparaffin, which comprises the steps of:

a. contacting said mono-olefin, in a fluorination zone at fluorination conditions, with a first liquid solution comprising from about 40 weight percent to about 65 weight percent of hydrogen fluoride and from about 60 weight percent to about 35 weight percent of a hydrogen fluoride-soluble hydrocarbon polymer having a molecular weight of from about 200 to about 500, to produce an alkyl fluoride from said mono-olefin; and,

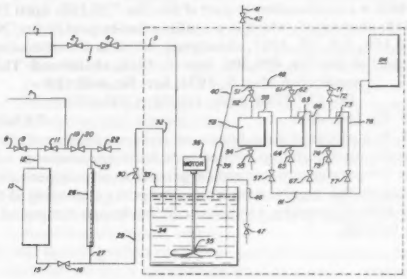
b. contacting said alkyl fluoride produced in Step (a), in an alkylation zone at alkylation conditions, with said lower molecular weight isoparaffin and with a second liquid solution comprising from about 70 weight percent to about 95 weight percent of hydrogen fluoride and from about 30 weight percent to about 5 weight percent of said hydrogen fluoride-soluble hydrocarbon polymer, and recovering said alkylation reaction product from the alkylation reaction mixture.

3,928,487

ALKYLATION PROCESS UTILIZING HYDROFLUORIC ACID WITH A MINOR AMOUNT OF FLUOROSULFURIC ACID

David A. McCaulay, Homewood, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Nov. 27, 1974, Ser. No. 527,715
Int. Cl.² C07C 3/54
U.S. Cl. 260—683.51 18 Claims



1. In a process for conducting a liquid-phase alkylation of at least one alkylatable isoparaffin with at least one alkylating agent selected from the class consisting of an olefin and an alkyl sulfate ester in the presence of a mixture of hydrofluoric acid and fluorosulfuric acid as the alkylation catalyst, under alkylation conditions, and in an alkylation reactor, to thereby produce hydrocarbons boiling in the gasoline range, the improvement comprising reacting at least one said alkylatable isoparaffin and at least one said alkylating agent in the presence of a catalyst comprising a major amount of hydrofluoric and a minor amount of fluorosulfuric acid, to thereby produce a high-octane product and to extend the effective life of the catalyst.

3,928,488

PROCESS FOR ISOMERIZING SATURATED HYDROCARBONS

Bernard Torck, Boulogne-sur-Seine; Jean-Pierre Franck, Bougival, and Michel Derrien, Rueil Malmaison, all of France, assignors to Institut Francais du Petrole, Paris, France

Continuation-in-part of Ser. No. 300,587, Oct. 25, 1972, Pat. No. 3,870,653. This application Nov. 25, 1974, Ser. No. 527,020
Claims priority, application France, Oct. 29, 1971, 71.39151
Int. Cl.² C07C 5/30
U.S. Cl. 260—683.68 9 Claims

1. In a process for converting a normal paraffin to an isoparaffin, wherein a mixture of hydrogen and a normal paraffin is contacted with a catalyst at an isomerization temperature, the improvement consisting of using, as the catalyst, the composition obtained by compositing alumina with (1) a platinum group metal, (2) a halogen compound selected from the group consisting of chlorinated hydrocarbons, chlorine, $SOCl_2$, SO_2Cl_2 and S_2Cl_2, and (3) an aromatic compound of the formula $(R)_m$ Ar $(Z)_x$ where x is an integer of at least 2, m is zero or an integer, $(x+m)$ being at most the maximum valence of Ar, Ar is an aromatic hydrocarbon radical containing at least one carbocyclic ring, the m groups R are independently halogen atoms or monovalent hydrocarbon radicals and the x groups Z are independently hydroxy, oxo or hydrocarbyloxy, the weight of said platinum group metal, the chlorine compound and said aromatic compound content beint respectively 0.01 – 5 %, 1 – 20 % and 0.001 – 20 % by weight of said catalyst.

3,928,489

METHOD FOR INCREASING THE THERMOSTABILITY OF ORGANOPOLYSILOXANES

Alfred Anisimovich Berlin, Leninsky prospekt, 57, kv. 9; Roza Mikhailovna Aseeva, 1 ulitsa Stroitelei, 7, korpus 1, kv. 133; Semen Markovich Mezhikovsky, Raketny bulvar, 13, korpus 2, kv. 62; Alla Ilinichna Sherle, ulitsa Petrovka, 23/10, kv. 46-a; Nadezhda Alexeevna Tsepalova, ulitsa Garibaldi, 19, korpus 4, kv. 8; Evgeny Alexandrovich Goldovsky, ulitsa Udaltsova, 10, kv. 107; Tatiana Vladimirovna Zelenetskaya, ulitsa Fersmana, 7, kv. 49; Rozalia Komalovna Fatkulina, ulitsa Osipenko, 44, kv. 6, and Alexandr Samoilovich Kuzminsky, Frunzenskaya naberezhnaya, 38, kv. 91, all of Moscow, U.S.S.R.

Continuation of Ser. No. 116,612, Feb. 18, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,082
Int. Cl.² C08L 39/04, 83/06
U.S. Cl. 260—827 9 Claims

1. A method for increasing the thermostability of organopolysiloxane elastomers containing aliphatic, aromatic, arylaliphatic or unsaturated radicals at the silicon atom comprising mixing together said organopolysiloxane and about 0.01 to 10 parts by weight of a polyethynylpyridine per 100 parts by weight of organopolysiloxane.

3,928,490

BLOCK POLYMERS OF POLYSILOXANES AND POLYBUTADIENE

William L. Hergenrother, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 232,610, March 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 52,136, July 2, 1970, abandoned. This application Aug. 16, 1973, Ser. No. 388,876
Int. Cl.² C08L 53/00, 83/10
U.S. Cl. 260—827 5 Claims

1. The method of producing a linear alternating block copolymer composed of (a) 1 to 80 per cent by weight of a polybutadiene with a vinyl content of at least 60 per cent by weight and (b) 20 to 99 per cent by weight of a linear polysiloxane having the formula $(R_2SiO)_x$ in which each R is a group from the class consisting of alkyl groups containing 1 to 4 carbon atoms, phenyl, tolyl and alpha and beta naphthyl, and x is 1400 to 10,000, which method comprises joining the linear high molecular weight polysiloxane and a butadienyl dilithium in an alkane solvent and thereby producing said linear alternating block copolymer.

3,928,491

MODIFIED VINYL ESTER RESIN AND PIPE MADE THEREFROM

William D. Waters, Tulsa, Okla., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Dec. 26, 1973, Ser. No. 428,116
Int. Cl.² C08L 63/10
U.S. Cl. 260—837 11 Claims

1. A thermosetting resin composition comprising the reaction product of an epoxy resin, a carboxyl terminated elastomer selected from the group consisting of carboxyl terminated homopolymers and copolymers of conjugated dienes and an unsaturated monocarboxylic acid,

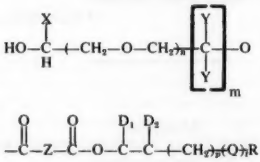
wherein approximately one chemical equivalent of epoxy is provided for each chemical equivalent of carboxyl provided by said elastomer and said acid combined.

3,928,492
COATING COMPOSITIONS CONTAINING MIXED ESTERS OF DIBASIC UNSATURATED ACIDS, GLYCOLS AND GLYCIDYL TERTIARY ESTERS, POLYESTERS AND AMINE-ALDEHYDE RESINS

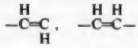
James C. Fang, Media, Pa., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

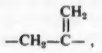
Filed Mar. 12, 1973, Ser. No. 340,382
Int. Cl.[2] C08L *61/28*, *67/06*
U.S. Cl. 260—850 2 Claims

1. In a composition comprising
A. a product obtained by condensing
1. an unsaturated dibasic acid;
2. a polyol; and
3. an alkanol of 3–18 carbon carbon atoms, or an alkylene oxide of 4–18 carbon atoms; and
B. an aminoplast resin,
the improvement comprising the presence in the composition of
C. a compound represented by the structure



where
X is hydrogen, alkyl of 1–4 carbon atoms or phenyl;
Y is hydrogen, —OH, —CH_2OH or alkyl of 1–4 carbon atoms (only one Y can be —OH);
Z is





or

D_1 is hydrogen;
D_2 is —OH;
Q is

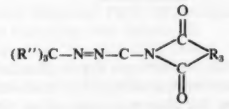
or —**0** —;
R is alkyl of 4–18 carbon atoms, or a singly, doubly or triply unsaturated hydrocarbon radical of 17 carbon atoms;
n is 0 or 1;
m is 1–5;
p is 0 or 1; and
t is 0 or 1.

3,928,493
CURING AND POLYMERIZATION PROCESSES INITIATED BY TERTIARY-ALIPHATIC-ALPHA-(IMIDO)-AZO COMPOUNDS

Ronald Edward Mac Leay, Williamsville; Harold Carl Lange, Grand Island, and Chester Stephen Sheppard, Tonawanda, all of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 88,120, Nov. 9, 1970, Pat. No. 3,812,094, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation-in-part of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation-n-part of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Mar. 5, 1974, Ser. No. 448,420
Int. Cl.[2] C08F *4/04*, *110/02*; C08L *67/06*
U.S. Cl. 260—864 7 Claims

1. In a process for the homo- or copolymerization of ethylenically unsaturated monomers which are responsive at suitable temperatures to free radical generators as polymerization initiators, the improvement which comprises employing as the free radical generator a t-aliphatic α-(imido)azo compound of the formula:



[(I)]

wherein:
$(R'')_3C$ is a tertiary C_4–C_{20} alkyl, cycloalkyl, alkylcycloalkyl, arylcycloalkyl or aralky group wherein each R'' is separately selected from C_1–C_8 alkyl, C_7–C_{12} aralkyl and C_6–C_{14} aryl, not more than one R'' being aromatic, and 2 or 3 of said R''s can join with the tertiary carbon atom to form a cyclo-, bicyclo-, or tricyclo-alkyl radical of 3–12 carbons;
R_1 and R_2 are separately selected from C_1–C_8 alkyl, C_3–C_{12} cyclo-, bicyclo- or tricycloalkyl, C_7–C_{12} aralkyl and 5–6 membered heterocyclic wherein the hetero atom is selected from oxygen or nitrogen, R_1 can also be C_6–C_{14} aryl, R_1 and R_2 taken together can form a C_3–C_{11} alkylene diradical, and one or more of each R_1 and R_2 can be substituted with lower alkoxy, hydroxy, carboxy, lower alkoxycarbonyl, lower acyloxy, halo, cyano, amido or lower alkylsulfonato; and
R_3 is C_2–C_{10} alkylene or alkenylene; C_3–C_{10} cycloalkenylene, cyclo- or bicycloalkylene or substituted cyclo- or bicycloalkylene; or C_6–C_{14} arylene or substituted arylene; the R_3 substituents being selected from lower alkyl, amino, halo, cyano and sulfo.

3,928,494
POLYBLEND OF TWO TYPES OF ABS GRAFT POLYMERS AND A COPOLYMER MATRIX

Vincent A. Aliberti, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 322,244, Jan. 9, 1973, abandoned. This application Apr. 22, 1974, Ser. No. 462,710
Int. Cl.[2] C08L *9/02*, *9/06*, *51/06*, *55/02*
U.S. Cl. 260—876 R 3 Claims

1. An improved polyblend adapted to display a combination of low temperature impact strength and room temperature tensile strength comprising (on a 100 weight percent total polyblend basis) from about 40 to 89 weight percent of a matrix phase comprising copolymer of styrene and acrylonitrile having a weight average molecular weight of from about 75,000 to 300,000 and a weight ratio of styrene to acrylonitrile of from about 95:5 to 30:70, with the balance up to 100 weight percent thereof being a mixture of a first graft copolymer with a second graft copolymer, said graft copolymers

being dispersed throughout said styrene/acrylonitrile copolymer when said polyblend is in a heat-fused form, the weight ratio of said first graft copolymer to said second graft copolymer in said polyblend ranging from about 85:15 to 5:95, said polyblend having a total elastomer content (ungrafted basis) ranging from about 10 to 30 weight percent (based on total polyblend),

A. said first graft copolymer particles being characterized by having

1. a number average particle size of from about 0.03 to 0.6 micron,
2. a substrate elastomer comprising a copolymer of from about 70 to 98 weight percent of a conjugated alkadiene with, correspondingly, from about 30 to 2 weight percent based on total substrate elastomer weight of at least one compound selected from the group consisting of styrene and acrylonitrile,
3. a superstrate grafted to said substrate elastomer and comprising polymerized styrene and acrylonitrile in the weight ratio of from about 95:5 to 30:70,
4. there being from about 30 to 100 parts by weight of grafted superstrate for each 100 parts by weight of said substrate elastomer, wherein

B. said second grafted copolymer particles being characterized by having a superstrate grafted to said substrate elastomer and comprising polymerized styrene and acrylonitrile in the weight ratio of from about 95:5 to 30:70 and from about 3 to 30 parts by weight of grafted superstrate for each 100 parts by weight of said substrate elastomer, wherein the improvement comprises said second grafted copolymer particles having:

1. a number average particle size of from about 0.6 to 3.0 microns, and at least half of such particles have a particle size above about 0.8 micron,
2. a substrate elastomer comprising homopolyalkadiene as the sole substrate, and
3. said second graft copolymer particles being comprised of agglomerated grafted subparticles at least 90 weight percent of which have particle sizes in the range of from about 0.05 to 0.15 micron before agglomeration.

3,928,495

CONTINUOUS PROCESS FOR THE PREPARATION OF ABS TYPE POLYBLENDS

William O. Dalton, Hampden, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 26, 1974, Ser. No. 464,426

Int. Cl.² C08L *9/02, 9/06, 51/06, 55/02*

U.S. Cl. 260—876 R **38 Claims**

1. A continuous mass polymerization process for the preparation of an ABS type polyblend, the steps comprising:

A. continuously charging a monomer composition comprising at least one alkenyl nitrile monomer of the formula:

wherein R is selected from the group consisting of hydrogen and alkyl radicals containing from 1 through 4 carbon atoms each and at least one monoalkenyl aromatic monomer of the formula:

wherein:

Ar is selected from the group consisting of a phenyl radical, an alkaryl radical of **6** through **9** carbon atoms, a monochlorophenyl radical, a dichlorophenyl radical, a monobromophenyl radical, and a dibromophenyl radical, and X is selected from the group consisting of hydrogen and an alkyl radical containing less than three carbon atoms to a reaction zone,

B. continuously maintaining in said reaction zone a reaction system comprising a liquid phase of said monomers with a vapor phase of said monomers generally thereabove,

1. said liquid phase filling said reaction zone to an extent of from about 10 to 95 percent by volume and comprising said monomer composition,
2. said vapor phase filling the balance up to 100 percent by volume of said reaction zone, the exact composition of said vapor phase being in substantial equilibrium with the exact composition of said liquid phase,

C. continuously subjecting said reaction system in said reaction zone to mixing action sufficient to maintain a substantially uniform composition distribution throughout said liquid phase in said reaction zone,

D. continuously mass polymerizing said monomers at a temperature from about 100° to 180°C. and a pressure of from about 5 to 150 psia forming a matrix copolymer dissolved in said liquid phase, while simultaneously and,

E. continuously dispersing uniformly a first and second grafted diene rubber into said liquid phase under the mixing action of step (C), and during the polymerization of step (D), said first grafted diene rubber being dispersed as rubber particles having a weight average particle size of about 0.7 to 10 microns, a swelling index of at least about 5 and having present occluded and grafted copolymer in an amount of from about 1 to **5** parts per part of rubber, said second grafted diene rubber being dispersed as rubber particles having a weight average particle size of about 0.1 to 0.5 microns, a swelling index of at least about 2 and being grafted with about 0.1 to 2.5 parts of copolymer per part of rubber, said second grafted rubber comprising from about 70 to 97% of the total weight of said first and second grafted diene rubbers dispersed providing a bimodal particle size distribution of said first and second grafted rubber particles in said liquid phase,

F. continuously removing said vapor phase from said reaction zone at a rate sufficient to maintain, in combination with any heat of reaction being absorbed in said reaction zone by said charging of monomers and with any heat of reaction being removed from said reaction zone through the peripheral boundaries thereof, in said reaction zone a substantially constant temperature and a corresponding substantially constant pressure within the respective temperature and pressure ranges above specified,

G. continuously removing said liquid phase from said reaction zone at a rate sufficient to maintain the above specified volume of said liquid phase,

H. continuously separating said matrix copolymer and said first and second grafted rubbers from said liquid phase removed in step (G) as an ABS polyblend,

I. said charging additionally being conducted:

1. at a rate substantially equal to the total rate at which monomers are polymerized in said reaction zone, and removed from said reaction zone, and
2. in a ratio of total alkenyl nitrile monomers to total

monoalkenyl aromatic monomers such that both a substantially constant said monomer composition is effectively maintained in said liquid phase in said reaction zone and in said matrix copolymer formed from said monomer composition,

J. the interrelationship between said charging, said liquid phase removal, and said substantially constant temperature and corresponding substantially constant pressure in said reaction zone being such that:

a. the weight percentage of said matrix copolymer in said liquid phase in said reaction zone is maintained at a substantially predetermined constant value,

b. the rate at which said matrix copolymer is formed from said monomer composition in said reaction zone ranges from about 0.05 to 2.0 pounds of said matrix copolymer produced per pound of said liquid phase per hour.

K. the interrelationship in said reaction zone between said mixing action and said vapor phase removal being such that said reaction system is maintained under substantially isothermal conditions,

L. the interrelationship between said charging, said vapor phase removal, and said reaction zone being such that:

1. at least about 10 percent of the heat of reaction is removed from said reaction zone by said vapor phase removal,

2. up to about 90 percent of the heat of reaction is absorbed by said charging, and

3. up to about 50 percent of the heat of reaction is removed through the peripheral boundaries of said reaction zone through heat transfer.

3,928,496
SYNTHETIC FIBER FOR PAPER AND METHOD FOR PRODUCING THE SAME

Hiromu Takeda; Takuichi Kobayashi; Koichiro Oka, all of Otsu, and Kazumi Tanaka, Kusatsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,486

Claims priority, application Japan, July 19, 1973, 48-80469; July 26, 1973, 48-83609; Aug. 2, 1973, 48-86384

Int. Cl.² C08L *51/00, 33/20;* **B32B** *17/10;* **D01F** *6/18*

U.S. Cl. 260—876 R **7 Claims**

1. A synthetic fiber capable of being fibrillated for forming paper, consisting essentially of:

A. about 5 – 40% by weight of a graft copolymer consisting of

a. about 20 – 80% by weight of polyvinyl alcohol, and

b. about 80 – 20% by weight of acrylonitrile chemically bonded to said polyvinyl alcohol, and

B. about 60 – 95% by weight of a copolymer consisting of

c. about 55 – 95% by weight of styrene, and

d. about 5 – 45% by weight of acrylonitrile.

3,928,497
PROCESS FOR PREPARING GRAFT-MODIFIED ETHYLENE PLYOMER OR COPOLYMER

Masahiko Ohmori, Iwakuni; Toshiharu Tomatsu, Ohtake, and Tadao Iwata, Iwakuni, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Apr. 26, 1974, Ser. No. 464,296

Claims priority, application Japan, May 1, 1973, 48-47588

Int. Cl.² C08L *23/26, 23/04*

U.S. Cl. 260—878 R **11 Claims**

1. A process for preparing a graft-modified ethylene homopolymer or copolymer by the reaction of an ethylene homopolymer or copolymer with a dicarboxylic acid graft-copolymerizable therewith or its graft-copolymerizable derivative in the presence of a radical initiator comprising

dissolving the ethylene homopolymer or copolymer in an alkyl-substituted aromatic solvent;

adding the dicarboxylic acid or its derivative to the solvent in which the ethylene homopolymer or copolymer is present at a rate of not more than 10^{-2} mol/hour per gram of starting ethylene polymer or copolymer; and,

continuing the addition until the graft-modified ethylene homopolymer or copolymer contains from 10^{-7} to 10^{-3} mol of units derived from the dicarboxylic acid or its derivative, per gram of the homopolymer or copolymer.

3,928,498
PREFORMED POLYMER LATEX IN EMULSION POLYMERIZATION SYSTEMS

Carl A. Uraneck, and John E. Burleigh, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 5, 1973, Ser. No. 376,582

Int. Cl.² C08F *2/22, 2/26, 2/30, 2/42*

U.S. Cl. 260—880 R **23 Claims**

1. In a process of aqueous emulsion polymerization wherein at least one polymerizable monomer polymerizable with a redox system or free-radical initiator is polymerized under aqueous emulsion polymerization conditions in the presence of a redox or free-radical initiator, aqueous emulsifier solution, and organosulfur compound as molecular weight modifier, and aqueous medium, the steps comprising:

admixing said aqueous emulsifier solution and said organosulfur compound,

coagitating said admixture of said aqueous emulsifier solution and said organosulfur compound to produce a coagitated mixture wherein the degree of said coagitation of said aqueous emulsifier solution and of said organosulfur compound is sufficient to effectuate a significant increase in the regulating index of said organosulfur compound as said modifier,

admixing said coagitated admixture of aqueous emulsifier solution and organosulfur compound molecular weight modifier with said polymerizable monomer and initiator and polymerizing the resulting polymerization admixture under aqueous emulsion polymerization conditions,

employing a preformed latex prepared by emulsion polymerization to the extent of about 0.1 to 10 parts by weight of polymer content of said latex per 100 parts by weight of said polymerizable monomer, wherein said preformed latex is added to said emulsifier/modifier admixture prior to coagitation thereof, subsequent to coagitation thereof, or to said emulsion polymerization system prior to, subsequent to, or with addition of said coagitated emulsifier/modifier admixture, and prior to addition of initiator to said emulsion polymerization system, said preformed latex effective to substantially avoid early depletion of said modifier in said emulsion polymerization system.

3,928,499
UNSATURATED POLY(AMIDE-ESTERS) AND CROSS-LINKED DERIVATIVES THEREOF

Donald A. Tomalia, and Bruce P. Thill, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

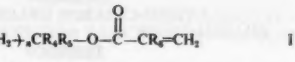
Filed Feb. 19, 1974, Ser. No. 443,265

Int. Cl.² C08L *31/02, 25/00;* **C08F** *210/00, 218/00*

U.S. Cl. 260—885 **15 Claims**

1. A substantially linear, film-forming, vinyl-addition polymer whose backbone comprises

a. at least about 1 mole percent of an interpolymerized unit corresponding to the formula

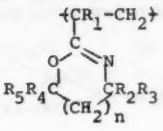


I

wherein:

R_1 is hydrogen or methyl; R_2, R_3, R_4 and R_5 are each independently hydrogen or lower alkyl of 1 to 4 carbon atoms; R_6 is hydrogen or methyl; and n is 0 or 1, and

b. from 0 to about 99 mole percent of an interpolymerized unit corresponding to the formula



II

wherein:

R_1–R_5 and n have the aforesaid meaning, with the proviso that units of formulas I and II constitute at least about 5 mole percent of said polymer.

3,928,500
PROCESSING AID FOR POLYVINYL CHLORIDE

Paul Kraft, Spring Valley; Adam F. Kopacki, Westwood, and Robert Brunner, Yonkers, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 178,795, Sept. 8, 1971, abandoned, which is a continuation-in-part of Ser. No. 43,568, June 4, 1970, which is a continuation-in-part of Ser. No. 760,067, Sept. 16, 1968, abandoned. This application Aug. 14, 1973, Ser. No. 388,288

Int. Cl.² C08L *27/22, 51/06, 31/02, 63/00*

U.S. Cl. 260—884 **22 Claims**

1. A process for the preparation of a polyacrylate-modified polyvinyl chloride processing aid which consists essentially of: (1) first preparing particles of polyvinyl chloride by suspension polymerizing vinyl chloride monomer in the presence of from about 0.01 to 5%, by weight, of the vinyl chloride monomer, of a suspending agent with agitation being applied to the system, said particles having a particle size in the range of from 5–150 microns; (2) removing unreacted vinyl chloride monomer from the system after polymerization of the vinyl chloride is at least about 60% complete; (3) adding to the suspension of polyvinyl chloride particles resulting from step (1) an effective concentration of a chain transfer agent and a solution of (a) an acrylate ester monomer selected from the group consisting of methyl methacrylate and mixtures of methyl methacrylate together with from about 20 to 0%, by weight, of one or more ethylenically unsaturated comonomers and (b) an effective concentration of at least one free radical initiating catalyst which is soluble in said acrylate ester monomer; said solution of acrylate ester monomer and catalyst having been pre-mixed prior to its addition to said suspension of polyvinyl chloride; said acrylate ester monomer being added to the system in a total amount to provide between about 20–100% of monomer, by weight of the polyvinyl chloride resulting from step (1); (4) suspension polymerizing the acrylate ester monomer in the presence of the mixture resulting from step (3) while applying agitation; and (5) recovering the particles of polyacrylate-modified polyvinyl chloride resulting from step (4); said particles of polyacrylate-modified polyvinyl chloride resulting from step (4) having a particle size in the range of from about 10 microns up to a maximum limit such that no more than about 15%, by weight are larger than about 150 microns; said particles of polyacrylate-modified polyvinyl chloride comprising particles of polyvinyl chloride having polyacrylate ester moieties in and/or on said polyvinyl chloride particles, said particles having a Relative Viscosity of from about 1.50–2.80 when determined, at 25° C., with a 1% solution of the polymer in cyclohexanone.

3,928,501
GRAFT POLYMERS OF HALO OXIRANE OR OXETANE ONTO HALO POLYMERIC BACKBONE

Edwin J. Vandenberg, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 27, 1974, Ser. No. 483,856

Int. Cl.² C08L *11/00, 23/00*

U.S. Cl. 260—890 **15 Claims**

1. A process for producing a graft polymer comprising contacting a halogen-containing polymer wherein at least 0.01 mole % of the units of the polymer contain at least one reactive halogen on a tertiary carbon atom or on a primary or secondary carbon atom alpha to an aromatic ring, to a carbon-to-carbon double bond or to a carbon-to-oxygen double bond with at least one halogen substituted oxirane or oxetane selected from the group consisting of haloalkylene oxides, haloalkyl glycidyl ethers, haloaryl glycidyl ethers, haloalkyl oxetanes and haloalkoxy oxetanes in the presence of a catalytic amount of an organoaluminum compound which has been modified by reaction with at least one of the group consisting of water, boron trifluoride and phosphorus pentafluoride under polymerization conditions at a temperature below about 0°C. until a graft of a polyether derived from said oxirane of oxetane has replaced at least one of said reactive halogens of the halogen-containing polymer.

3,928,502
PROCESSABLE NON-BURNING ABS-PVC BLENDS

Hubert J. Fabris, Akron, and Wendell O. Phillips, Stow, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Aug. 4, 1971, Ser. No. 169,081

Int. Cl.² C08K *3/22;* **C08L** *9/02, 27/06*

U.S. Cl. 260—891 **8 Claims**

1. A homogeneous blend consisting essentially of

A. ABS terpolymers prepared from monomers of which 20 to 40 weight percent is selected from the group consisting of butadiene-1,3 and isoprene, 15 to 35 weight percent is selected from the group consisting of acrylonitrile and methacrylonitrile and 35 to 55 weight percent is selected from the group consisting of styrene and alphamethylstyrene, said ABS terpolymers having a heat distortion temperature in the range of about 195° to 245°F.,

B. chlorinated saturated aliphatic hydrocarbon polymers containing an average of from about 0.4 to about 1 chlorine atom per carbon atom and having an intrinsic viscosity of from about 0.25 to 2.5,

components (A) and (B) being in a weight ratio from about 60:40 to 40:60, and

C. from 2 to 12 parts by weight per 100 parts by weight of total components (A) and (B) of stannic oxide.

3,928,503
METHOD FOR WORKING UP CHLOROPOLYOLEFIN SOLUTIONS

Erich Hambsch, Inningen; Helmut Klug, Aystetten; Herbert Ortner; Walter Semmlinger, both of Gersthofen, and Rudolf Wirtz, Goggingen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 850,229, Aug. 14, 1969, abandoned. This application July 15, 1971, Ser. No. 163,069

Claims priority, application Germany, Aug. 31, 1968, 1794061

Int. Cl.² C08L *23/28*

U.S. Cl. 260—897 C **5 Claims**

1. A method for isolating chloropolyolefins in a solid, particulate form from solutions of chloropolyolefins obtained by chlorinating polyolefins in organic solvent which comprises

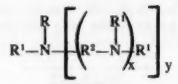
adding said solution to a pulverulent to a finely granular component selected from the group consisting of polyvinyl acetate, chlorinated polyolefins, polyvinyl chloride, polyvinylidene chloride, flourine-containing polymers, chlorinated polyvinyl chloride and mixtures thereof while said component is being agitated and as the solution is added simultaneously removing the solvent from the resulting mixture so that said mixture remains in essentially a dry state, said component being present in an amount such that the isolated chloropolyolefin contains at least 5% by weight thereof.

3,928,504
DYEABLE POLYPROPYLENE COMPOSITIONS CONTAINING A POLYAMINE ADDUCT

Pieternella Koelewijn, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 6, 1974, Ser. No. 530,104
Claims priority, application United Kingdom, Dec. 12, 1973, 57564/73
Int. Cl.² C08L *23/12*
U.S. Cl. 260—897 B **9 Claims**

1. An improved dyeable polypropylene composition comprising a isotactic polypropylene and a polyamine adduct containing at least two nitrogen atoms having the following formula:



where R is a substantially isotactic polypropylene chain having at least 25 carbon atoms, R^1 is R, a hydrogen, alkyl, cycloalkyl, aryl or nitrogen heterocyclic group, R^2 is an alkyl, cycloalkyl or aryl group having at least 2 carbons, no one carbon of R^2 being attached to more than one nitrogen atom, x is an integer from 0 to 6 inclusive, y is an integer from 1 to 6 inclusive, and the total molecular weight of the nitrogen atoms, R^2 and R^1 when R^1 is not R is less than about 300.

3,928,505
DIPENTAERYTHRITOL AND PENTAERYTHRITOL PHOSPHITE

James D. Klicker, Morgantown, W. Va., and Murray S. Cohen, Convent Station, N.J., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 16, 1974, Ser. No. 515,254
Int. Cl.² C07F *9/15*
U.S. Cl. 260—921 **8 Claims**

1. Mixed mono-pentaerythritol-dipentaerythritol phosphite prepared by reacting 70 to 94 molar percent of mono pentaerythritol and 30 to 6 molar percent of dipentaerythritol with a phosphite of the formula:

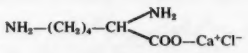
where each of R_1, R_2 and R_3 is an alkyl of 1 to 12 carbon atoms, benzyl, cyclohexyl, phenyl, tolyl, haloalkyl of 2 to 3 carbon atoms or halophenyl wherein the total phosphite employed is sufficient to provide mono pentaerythritol to dipentaerythritol to phosphite in the relative proportion of from 3 moles of mono pentaerythritol to 3 moles plus 10% in excess thereof for 4 moles of phosphite and from 1 mole of dipentaerythritol to 1 mole plus 10% in excess thereof for 2 moles of phosphite, and removing the R_1OH, R_2OH and R_3OH formed, said mono pentaerythritol-dipentaerythritol phosphite being pourable at 160°C.

3,928,506
LYSINO-CALCIUM CHLORIDE AND PHARMACEUTICALLY ACCEPTABLE ACID SALTS THEREOF

Jean, Georges Gobert, Brussels, and Jean, Adolphe Close, Linkebeek, both of Belgium, assignors to UCB Societe Anonyme, Brussels, Belgium

Filed Dec. 28, 1973, Ser. No. 429,297
Claims priority, application United Kingdom, Jan. 2, 1973, 192/73
Int. Cl.² C07C *101/26*; C07F *9/08*
U.S. Cl. 260—924 **24 Claims**

1. A compound selected from the group consisting of lysino-calcium chloride of the formula



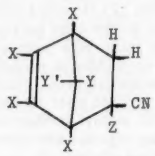
its laevorotatory form, its dextrorotatory form mixtures of these forms and pharmaceutically acceptable acid addition salts thereof.

3,928,507
SUBSTITUTED NORBORNENE COMPOUNDS AND THEIR APPLICATIONS IN THERMOPLASTIC POLYMER COMPOSITIONS

Nicodemus E. Boyer, Parkersburg, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 248,773, April 28, 1972, Pat. No. 3,784,581, which is a continuation of Ser. No. 824,668, May 14, 1969, abandoned. This application June 15, 1973, Ser. No. 370,266
Int. Cl.² C07F *9/02*; C07C *121/48*
U.S. Cl. 260—940 **3 Claims**

1. A 2-substituted-2-cyano-norbornene compound of the formula



wherein X is a halogen selected from the group chlorine, fluorine and bromine, Y and Y′ are independently selected from the group hydrogen chlorine, fluorine, bromine, 1 to 4 carbon alkyl and 1 to 4 carbon atom alkoxy and Z is a phosphono group of the formula

wherein R and R′ are each selected from the group 1 to 4 carbon atom alkyl, and 1 to 4 carbon atom alkoxy.

3,928,508
S-(N-ACYL-N-ALKYL OR PHENYL-AMIDOCARBONYL)-ETHYL-THIO-PHOSPHORIC AND- -PHOSPHONIC ACID ESTERS

Claus Stölzer, c/o Bayer Aktiengesellschaft, Wuppertal-Elberfeld, and Ingeborg Hammann, c/o Bayer Aktiengesellschaft, Leverkusen, both of Germany

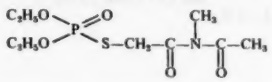
Filed Aug. 1, 1973, Ser. No. 384,676

Claims priority, application Germany, Aug. 16, 1973, 2240031

Int. Cl.² A01N 9/36; C07F 9/165, 9/40

U.S. Cl. 260—943 **4 Claims**

3. The compound S-(N-acetyl-N-methyl-amidocarbonyl)-methylthiolphosphoric acid O,O-diethyl ester of the formula



3,928,509
HYBRID IONIC PHOSPHORUS COMPOUNDS

Helmut Diery, Keikheim, Taunus, and Ulrich Cuntze, Hofheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

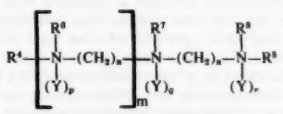
Filed Apr. 10, 1974, Ser. No. 459,545

Claims priority, application Germany, Apr. 14, 1973, 2319047

Int. Cl.² C07F 9/141; A01N 9/36

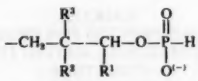
U.S. Cl. 260—945 **3 Claims**

1. A compound of the general formula I



(I)

in which R^4 stands for an alkyl or alkenyl group of 8 to 20 carbon atoms, R^5 for hydrogen, an alkyl or alkenyl group of 1 to 20 carbon atoms, R^6, R^7 and R^8 each stands for hydrogen, the methyl or ethyl group, *m* for zero or 1, *n* for 2 or 3 and *p*, *q* and *r* each stands for zero or 1, the sum of all values of *p*, *q* and *r* having to be 1 or 2; Y stands for a group of the formula II



(II)

in which R^1 stands for hydrogen, R^2 and R^3 each for hydrogen or an alkyl group of 1 to 4 carbon atoms, which may be identical or different.

3,928,510
BENZENE PHOSPHONIC ACID ESTERS

Kurt Hoger, Muenchenstein, and Guenther Tscheulin, Rienhen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

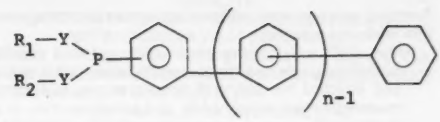
Continuation-in-part of Ser. No. 191,079, Oct. 20, 1971, Pat. No. 3,825,629. This application Apr. 25, 1974, Ser. No. 463,864

Claims priority, application Switzerland, Oct. 22, 1970, 15605/70; June 30, 1971, 9597/71

Int. Cl.² C07F 9/46

U.S. Cl. 260—962 **14 Claims**

1. A compound of the formula



wherein

R_1 and R_2 are each, independently, a hydrocarbon radical of up to 16 carbon atoms selected from the group consisting of alkyl, cycloalkyl, aryl, alkylaryl and arylalkyl,

Y is oxygen or sulphur, and

n is 1 or 2.

3,928,511
CHOKE VALVE ASSEMBLY

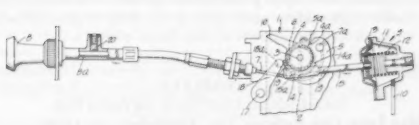
Minoru Atsumi, Kawagoe, and Toshimasa Shishido, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1974, Ser. No. 447,238

Claims priority, application Japan, Mar. 6, 1973, 48-25730

Int. Cl.² F02M 1/02

U.S. Cl. 261—64 C **8 Claims**



1. In a choke valve assembly for an air intake passage of an internal combustion engine, the combination of: a turnable choke shaft having a choke valve fixed thereto to control flow through said air intake passage, an actuator connected to turn the shaft in a direction to close the choke valve, the actuator being provided with a cam track, means responsive to engine vacuum pressure for turning the shaft in a direction to open the choke valve, and means including a limiter member connected to limit the extent of opening movement of the choke valve in accordance with the position of said actuator, said limiter member having a follower engaging said cam track.

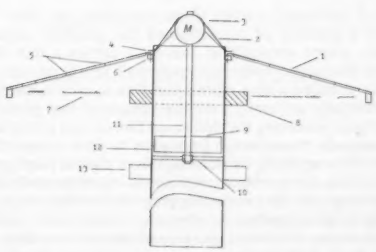
3,928,512
BIO POND AERATOR

Kenneth Floyd Cherry, 4406 Suder Ave., Toledo, Ohio 43611

Filed Mar. 4, 1974, Ser. No. 447,895

Int. Cl.² B01F 3/04

U.S. Cl. 261—91 **3 Claims**



1. An aeration device adapted for positioning on a liquid pond for the purpose of transferring oxygen from the atmosphere to the liquid comprising a central tubular section and mounted externally thereon a buoyant means consisting of a

float ring with buoyancy sufficient to support the entire structure while in operation,

motor, shaft, and impeller combination with said impeller positioned inside said tubular section below said float ring and attached by said shaft to said motor, said motor mounted on and supported by said tubular section so as to impart the torque generated by turning said impeller inside said tubular section to said tubular section, said motor shaft and impeller combination sized and positioned to raise said liquid within said tubular section,

at least two liquid overflow weirs positioned in said tubular section above said float ring to allow said raised liquid to flow over said weirs and out of said tubular section,

bracket assemblies mounted below each said liquid overflow weirs externally on said tubular section between said float ring and said liquid overflow weirs,

aerator arms of a channel shape with a float on one end and a hinge structure on the other end, said hinge structure compatible with said bracket assemblies for attachment of one aerator arm below each said overflow weir, said aerator arms positioned during operation so that the end with a float is below the hinged end and said liquid flowing over said overflow weirs onto said aerator arms will flow toward the float end,

holes in the lower surface of said aerator arms to allow portions of said liquid to flow through said holes and impact on the surface of said liquid pond, causing aeration to said liquid pond and the general flow of said liquid through said aeration device resulting in general movement and circulation of said liquid pond.

3,928,513

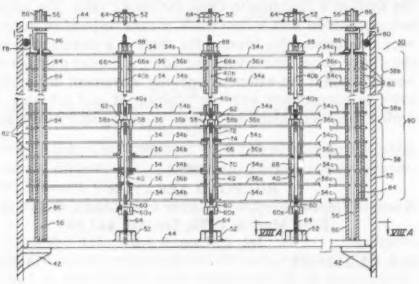
GAS-LIQUID CONTACT APPARATUS

Max Leva, One Hodgson Ave., Pittsburgh, Pa. 15205

Continuation-in-part of Ser. No. 180,381, Sept. 14, 1971, abandoned. This application June 5, 1973, Ser. No. 367,133

Int. Cl.² B01F *3/04*

U.S. Cl. 261—113 **21 Claims**



1. A gas-liquid contact tower comprising an outer tower shell, a plurality of superimposed flat generally horizontal plates spaced vertically so that each carries a thin film of liquid discharged within said tower shell, said horizontal plates being provided with a plurality of flow apertures distributed substantially uniformly over the surface of said plates, said apertures permitting the thin liquid film on said plates to flow downwardly therethrough from plate to plate and permitting gas to flow upwardly therethrough from plate to plate, each of said plates comprising a plurality of segments stacked with their edge portions in overlapping relationship but without being welded together or otherwise directly and rigidly secured to one another, a plurality of tie rods extending vertically through registering apertures in said plates for clamping the plates together, at least one of said tie rods extending through registering apertures formed respectively in said overlapping segment edge portions, and at least those registering apertures for said one tie rod being larger respectively than the adjacent cross sections of said one tie rod and being shaped so that said plate segments can expand and contract in the planes thereof and in different directions transverse to one another.

3,928,514

PROCESS FOR THE PRODUCTION OF GUDOL POWDER UTILIZING REDUCTION OF MOISTURE CONTENT

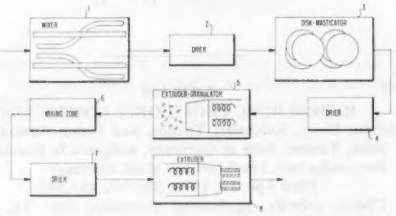
Heinrich Brachert, Troisdorf-Oberlar; Dieter Girke, and Joachim Kleiss, both of Liebenau, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Apr. 3, 1974, Ser. No. 457,610

Claims priority, application Germany, Apr. 3, 1973, 2316538

Int. Cl.² C06B *21/00*

U.S. Cl. 264—3 B **6 Claims**



1. In a process for the preparation of "Gudol powder" from a final mixture of nitrocellulose, diglycol dinitrate, nitroguanidine, and additives, wherein an aqueous raw mixture of nitrocellulose and diglycol dinitrate is premixed with the other components, the said final mixture then dehydrated in part, plasticized, and finally pressed into the final shape of the powder product, the improvement which comprises reducing the water content of the premixed components in a first drying stage, then homogenizing and preplasticizing the premixed components in a continuously operating masticator, thereafter further reducing the water content of the composition in a second drying stage, thereupon plasticizing and converting the composition into granular form in a continuously operating extruder, adjusting the moisture content of the granulated material to a required pressing or extruding moisture, and finally extruding the granulated material to the final shape of the powder product in a continuously operating extruder.

3,928,515

SEMICONTINUOUS PROCESS FOR PRODUCING OXIDE REFRACTORY MATERIAL HAVING FINE CRYSTAL STRUCTURE

Wesley Q. Richmond, Stevensville, Canada, and Paul Cichy, Buffalo, N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Filed June 15, 1971, Ser. No. 153,318

Int. Cl.² B22D *23/08*

U.S. Cl. 264—5 **7 Claims**

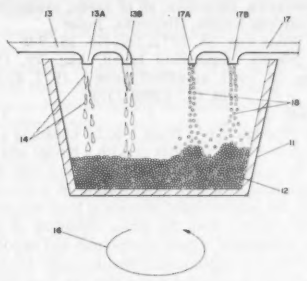
1. A semicontinuous process for rapidly cooling and solidifying a melt of oxide refractory material, comprising the steps of

1. first filling a solidification chamber to a depth of at least about 15 cm with an initial supply of solid steel sphere cooling media of a size between about 5 and about 60 mm and which is non-reactive and non-melting with respect to the melt of oxide refractorymaterial; then simultaneously

2. adding additional steel sphere cooling media, of a size between about 5 and about 60 mm and which is non-reactive and non-melting with respect to the melt of oxide refractory material, over the initial supply of steel sphere cooling media, while

3. casting a melt of the oxide refractory material into the

solidification chamber, over the initial supply of steel sphere cooling media and the additional steel sphere



cooling media, whereby the melt is rapidly cooled and solidified.

3,928,516
CONTINUOUS METHOD FOR MAKING SPINNABLE POLYACETYLENE SOLUTIONS CONVERTIBLE TO HIGH STRENGTH CARBON FIBER

Daniel E. Sliva, Pittsfield, Mass., and William G. Selley, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 30, 1972, Ser. No. 310,989
Int. Cl.² D01D *5/04*; B05B *3/00*
U.S. Cl. 264—29 **8 Claims**

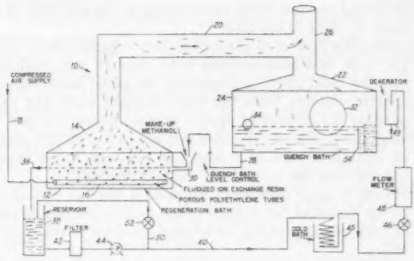
1. A continuous process for making polyacetylene fiber which comprises:

1. producing a polyacetylene solution having at least 3% polymer solids by weight by the oxidative coupling of diethynyl organo compounds, selected from the class consisting of metadiethynylbenzene, para-diethynylbenzene and bis-phenol-A dipropargyl ether and a mixture of metadiethynylbenzene and para-diethynylbenzene,
2. passing said polyacetylene solution through a thin film evaporator to produce a solution spinnable polyacetylene concentrate having a solids concentration of up to about 33% by weight,
3. spinning said polyacetylene concentrate,
4. and collecting the resulting polyacetylene fiber.

3,928,517
QUENCH BATH REGENERATION SYSTEM FOR MICROPOROUS FILM PRODUCTION

Rodney A. Knight, New Milford; Joseph A. Zang, Cos Cob, and John Slanski, Trumbull, all of Conn., assignors to AMF Incorporated, White Plains, N.Y.

Filed Dec. 26, 1973, Ser. No. 427,743
Int. Cl.² B29D *27/04*; D01F *13/04*
U.S. Cl. 264—38 **14 Claims**

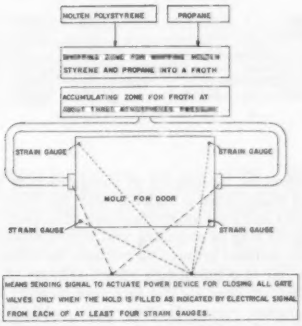


1. In a method of preparing a film by casting a film of a dope solution comprised of a film-forming polymer in a solvent system comprising formic acid and quenching said film in a quench bath comprising a non-solvent system for said polymer, the improvement which comprises continuously contacting at least a portion of said non-solvent system with a heterogeneous esterification catalyst in the presence of methanol to form methyl formate by esterification of formic acid with said methanol and removing the methyl formate therefrom.

3,928,518
LOW PRESSURE INJECTION MOLDING INVOLVING MOLD FILL DETECTION

Walter H. Greenberg, Syossett, N.Y., assignor to Beschoff Chemical Corporation, Hicksville, N.Y.

Continuation of Ser. No. 28,088, April 13, 1970, abandoned.
This application Sept. 15, 1972, Ser. No. 289,415
Int. Cl.² B29D *27/00*; B29F *1/00*
U.S. Cl. 264—40 **1 Claim**


MOLTEN POLYSTYRENE
PROPANE
STYRENE AND PROPANE INTO A FROTH
ACCUMULATING ZONE FOR FROTH AT
STRAIN GAUGE
STRAIN GAUGE
MOLD FOR DOOR
STRAIN GAUGE
STRAIN GAUGE
MEANS SENDING SIGNAL TO ACTUATE POWER DEVICE FOR CLOSING ALL GATE
VALVES ONLY WHEN THE MOLD IS FILLED AS INDICATED BY ELECTRICAL SIGNAL
FROM EACH OF AT LEAST FOUR STRAIN GAUGES.

1. In the method of converting a mixture of an organic thermoplastic and gas to a cellular plastic article in which said organic thermoplastic is heated to provide molten plastic, in which gas cells are distributed throughout the molten plastic to provide a mixture of molten plastic and gas, in which a mixture of molten plastic and gas is injected at superatmospheric pressure into a mold, in which the mold is cooled to cool the mixture of molten plastic and gas to thereby form a cellular plastic article, in which a cellular plastic article is removed from the cooled mold, the improvement which includes the steps of:

directing a mixture of gas and molten thermoplastic selected from the group consisting of polyethylene, nylon, and polystyrene, into a heated accumulating zone for temporary storage at a superatmospheric pressure less than about 5 atmospheres, said gas being selected from the group consisting of trifluorochloromethane, carbon dioxide, and propane;

providing at least two heated conduits from said accumulating zone to a mold for a giant article, each conduit having a cross sectional area of at least 100 square centimeters, each said conduit being controllable at the entrance to a mold for flow or no flow;

initiating the flow of mixture of molten organic plastic and gas from said accumulating zone through the conduits into the mold, thereby displacing the gas at about atmospheric pressure from the mold through vents and expanding the mixture of molten organic plastic and gas;

sensing the arrival of expanded mixture of hot molten plastic and gas at each of at least four positions in the mold remote from the inlets from the said conduits;

providing a signal only when the mold is filled as indicated by the arrival of the mixture of hot molten plastic and gas at each of the plurality of sensing positions in the mold; and

utilizing said signal instantly to terminate the flow of mixture of molten plastic and gas into the mold, whereby the low pressure injection molding is responsive to the filling of the mold with cellular plastic from said accumulating zone maintained at a pressure less than five atmospheres.

3,928,519
METHOD FOR FORMING ON AN ELONGATED CORE MEMBER A COVERING OF THERMOPLASTIC MATERIAL BY EXTRUSION

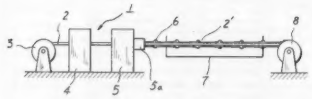
Hiroshi Kashiyama, and Susumu Tobita, both of Ichihara, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed July 25, 1973, Ser. No. 382,347

Claims priority, application Japan, July 29, 1972, 47-75552; Feb. 7, 1973, 48-14622; Apr. 4, 1973, 48-37850; Feb. 14, 1973, 48-18708

Int. Cl.² B29F *3/10;* **D01D** *13/06*

U.S. Cl. 264—40 **7 Claims**



1. A method for forming on an elongated core member a covering of thermoplastic material with the outer diameter thereof varied along the longitudinal axis of said core member, comprising the step of extruding said thermoplastic material on said core member through an extruder die while said core member is fed at a pulsatingly varied velocity of said core member, characterized by that said core member has a substantially constant average feeding velocity while said thermoplastic material has a substantially constant average volumetric flow rate at which said thermoplastic material is extruded from said extruder die; and that said pulsatingly varied velocity of said core member is established at a point before entry of said core member into said extruder to have a maximum value which is greater than the average flow rate of said thermoplastic material through said extruder die at the outlet thereof and to have a minimum value which is negative, with said maximum and minimum values alternately repeated in a periodical manner whereby said covering varies in the outer diameter thereof along the longitudinal axis of said core member.

3,928,520
BLACK LEAD AND PRODUCTION THEREOF

Masanori Shinomoto, Yokosuka; Kenji Oyaide, Kawasaki, and Etsuo Shinkawa, Hiratsuka, all of Japan, assignors to Pilot Kiko Kabushiki Kaisha, Hiratsuka, Japan

Filed Aug. 18, 1972, Ser. No. 281,940

Claims priority, application Japan, Aug. 19, 1971, 46-63220; Aug. 25, 1971, 46-65000; June 3, 1972, 47-55523

Int. Cl.² C09B *13/00*

U.S. Cl. 264—42 **11 Claims**

1. In the production of a black lead by kneading a coloring material together with a binder or with a binder and a liquid, extruding the resulting mixture into a thin raw lead and burning said raw lead at a high temperature in a non-oxidizing atmosphere, the improvement wherein at least one pore-forming material selected from the group consisting of inorganic substances, sublimable organic compounds and depolymerizable high polymers is added to said mixture under kneading; the resulting mixture is extruded into a thin raw lead through the nozzle of an extruder at an extrusion speed of at least 4 meters per second; said thin raw lead is burned by heating it to raise the temperature thereof gradually from 150° to 300°C at a rate of less than 5°C/hr; and wherein the pore-forming material or materials are removed from the raw lead thereby to form minute continuous pores within the black lead.

3,928,521
METHOD OF MAKING MICROPOROUS ELASTOMERIC MATERIAL

Doyle V. Haren, Clyde, and Arthur D. Logan, Waynesville, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Dec. 27, 1973, Ser. No. 428,965

Int. Cl.² B29H *7/20*

U.S. Cl. 264—49 **15 Claims**

1. A method of making an ink-dispensing article comprising the steps of; forming a microporous rubber ink-dispensing material which has interconnected cavities, said forming step comprising the steps of, admixing sized particles of hydrated magnesium sulfate in a rubber matrix material, curing the rubber matrix material and simultaneously causing liberation of water of crystallization from said hydrated magnesium sulfate which provides a blowing effect resulting in the formation of interconnecting passages between said particles, and leaching said particles from said matrix material, said leaching being achieved in an accelerated manner due to said interconnecting passages; and fixing the microporous material to an associated support means to define said article.

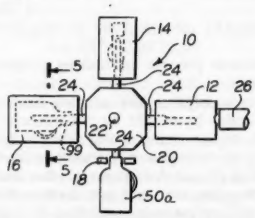
3,928,522
METHOD OF MAKING A BLOW MOLDED CONTAINER WITH HOLLOW HANDLE

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.

Filed June 14, 1974, Ser. No. 479,547

Int. Cl.² B29C *17/07, 17/12*

U.S. Cl. 264—89 **16 Claims**



1. The method of making a container with a hollow handle by injection blow molding, which method comprises injection molding a parison on a core rod, transferring the core rod and

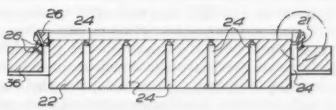
parison from an injection mold to a first blow mold having a cavity which is longer than the parison, which has a diameter greater than that of the parison, and which has portion of the first blow mold cavity confining the plastic of the parison to a limited circumferential stretching during the partial blowing of the parison in the first blow mold, and stretching the material of the parison lengthwise of the core rod by the partial blowing with such longitudinal stretching being greater than the increase in diameter during the partial blowing step applying fluid under pressure to the mold cavity of the first blow mold on the outside of the parison during the partial blowing so as to maintain a fluid cushion around the outside of the parison for limiting movement of the parison into contact with cavity walls of the first blow mold and to allow for the longitudinal stretching brought together over an area bounded on three sides by a hollow part of the handle portion and on the fourth side by part of the parison that was not displaced into said clearance on one side of the cavity, shearing the compressed part from the rest of the handle portion and from the part of the parison that was not displaced into the handle portion of the cavity, removing the sheared material, and then transferring the core rod and partially blown container to a second blow mold having a cavity shaped to the desired contour of the finished container, blow molding the container in the second blow mold and thereafter stripping the container from the core rod.

3,928,523

MOULDING OF SYNTHETIC PLASTICS SHEET MATERIAL

Peter Ward, 4 The Croft, Oulton, near Leeds, Yorkshire, and Jack Brocklehurst, 13 Beech Wood, Woodlesford, near Leeds, both of England

Filed Dec. 26, 1973, Ser. No. 428,399
Int. Cl.² B29C *17/04*
U.S. Cl. 264—93 **1 Claim**



1. The method of molding lids from thermoplastic heat softened sheet material to form a lid having a raised location ring thereon and a downturned peripheral annular flange having an inwardly protruding bead therearound, the method comprising the steps of

1. clamping a portion of the heat softened thermoplastic sheet material in a flat plane between opposed annular clamping surfaces of a pair of dies to distort the thermoplastic material out of said plane into a groove in one of said surfaces to form a raised location ring encircling a center portion of the lid, and

2. forming on the lid a beaded peripheral flange that extends from said clamping plane in a direction opposite to that in which the raised location ring extends from said plane by causing the peripheral portion of the sheet material extending outside the clamped portion to be forced by air pressure against an undercut contoured surface in one of the dies to form an inwardly protruding bead around the downturned peripheral flange of the lid.

3,928,524

PROCESS FOR REDUCING ELECTROSTATIC CHARGE ON POLYTETRAFLUOROETHYLENE AGGLOMERATES

Glenn Frederick Leverett, Vienna, W. Va., assignor to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jan. 17, 1973, Ser. No. 324,503
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B01J *2/06*
U.S. Cl. 264—117 **5 Claims**

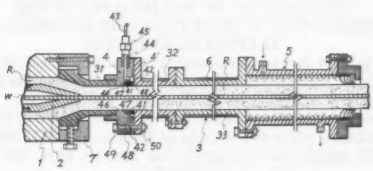
1. Process for producing agglomerates of particles of finely ground polytetrafluoroethylene which comprises agitating particles of finely ground polytetrafluoroethylene having a particle diameter of between 1 and 100 microns in a mixture of (a) demineralized water having a conductivity of at least 50 micromhos/cm in which the at least 50 micromhos conductivity is obtained by dissolving in the water an electrolyte which is volatile at a temperature of between about 100°C. and 300°C. and (b) an immiscible organic liquid which can be soluble in water in amounts up to 15 percent by weight at the operating temperature of the process and which has a surface tension of no greater than 40 dynes/cm at 25°C., said organic liquid being present in an amount of between 5 and 50 percent by weight of the water and the polytetrafluoroethylene, followed by separating the resulting agglomerates from the water mixture and drying them.

3,928,525

METHOD FOR FORMING AND VULCANIZING VULCANIZABLE MATERIALS

Masaru Fuwa; Kiyoshi Takahashi, both of Ami; Masaaki Otsuji, Nishinomiya, and Masatake Matsui, Takatsuki, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Dainichi-Nippon Cables, Ltd., Japan

Continuation of Ser. No. 212,049, Dec. 27, 1971, abandoned.
This application Nov. 19, 1973, Ser. No. 416,847
Claims priority, application Japan, Dec. 29, 1970, 45-127273; June 26, 1971, 46-46660
Int. Cl.² B29F *3/10*
U.S. Cl. 264—174 **13 Claims**



1. A method for forming and vulcanizing a vulcanizable material comprising passing a mixture of an organic peroxide vulcanizable polymer and an organic peroxide through a long-land die having a forming zone and a succeeding vulcanizing zone maintained at a temperature of at least 140°C., while simultaneously supplying a forming coagent onto the inner surface of said long-land die, said forming coagent being characterized by

a. a viscosity of at least 1.1 centi-strokes and at most 3,000 centi-strokes at 235°C.,

b. an absorption ratio to the said polymer at 150°C. for 45 hours less than 30 mg./cm.²,

c. not being subject to gelation even in contact with said organic peroxide in the course of vulcanization, non-gelation being determined by a viscosity ratio of η_1/η_0 of less than 30, wherein η_0 is the viscosity of the forming coagent at 235°C. and η_1 is the viscosity of a mixture of 10 parts by weight of forming coagent and 1 part organic peroxide at a temperature of 235°C., and

d. not being boiled in the course of vulcanization; the forming coagent being supplied in such a manner as to main-

tain a continuous film between the inner surface of said die and the polymer product.

3,928,526

PROCESS FOR PRODUCING CURED PHENOLIC CONTINUOUS FILAMENTS

Hiroaki Koyama, Osaka, Japan, assignor to Nippon Kynol Inc., Osaka, Japan

Filed June 1, 1973, Ser. No. 366,096
Claims priority, application Japan, June 3, 1972, 47-55314
Int. Cl.² B29C *25/00*
U.S. Cl. 264—236 **17 Claims**

1. A process for producing a drawn or undrawn cured phenolic continuous filament which comprises melt-spinning an uncured novolak resin which may contain a fiber-forming thermoplastic synthetic resin selected from the group consisting of nylon resin and polyurethane resin in an amount of less than 30 % by weight based on the total weight of the novolak resin and the thermoplastic synthetic resin and then curing the melt-spun filament with an aldehyde as a curing agent in the presence of a catalyst; said novolak resin produced by the reaction of a phenol selected from the group consisting of phenol, o-cresol, m-cresol, p-cresol, 2,3-xylenol, 2,5-xylenol, 2,4-xylenol, 2,6-xylenol, 3,4-xylenol, 3,5-xylenol, o-ethylphenol, m-ethylphenol, p-ethylphenol, p-phenylphenol, p-tertiary butyl phenol, p-tertiary amylphenol, bisphenol A, resorcinol and mixtures thereof and an aldehyde selected from the group consisting of formaldehyde, paraformaldehyde, benzaldehyde, hexamethylenetetramine, furfural and mixtures thereof; characterized by precuring the melt-spun novolak filament with the aldehyde in the presence of an acid catalyst in two or three precuring baths maintained at progressively higher temperatures and then curing the precured filament with the aldehyde in the presence of a catalyst selected from the group consisting of acid catalysts and basic catalysts.

3,928,527

PREPARATION OF MOLDING PLATE FOR PRODUCTION OF HIGH-PRESSURE DECORATIVE TEXTURED LAMINATES

George J. Wohnhaas, Baltimore; Israel S. Ungar, and Herbert I. Scher, both of Randallstown, all of Md., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 355,436, April 30, 1973, abandoned, which is a division of Ser. No. 784,933, Dec. 18, 1968, abandoned. This application Dec. 16, 1974, Ser. No. 533,855
Int. Cl.² B29D *9/06*
U.S. Cl. 264—258 **6 Claims**

1. The new use of a hard, heat-resistant metallic plate as a molding die to produce high-pressure, textured, decorative laminates, said hard, heat-resistant metallic plate having a polished surface and a finely-roughened texture of 200–1000 microinches R.M.S. provided by bombarding or blasting the surface of said plate at high velocity with small, smooth, nonabrasive hard balls, and then electropolishing, said new use comprising:

placing a series of resin impregnated fiber sheets directly adjacent said hard, heat-resistant metallic plate having a finely-roughened texture,

pressing said resin impregnated fiber sheets against said hard, heat-resistant, finely-roughened metallic plate under high pressure and elevated temperature to produce a textured high-pressure laminate,

stripping said high-pressure laminate from said hard, heat-resistant, finely-roughened metallic plate, and

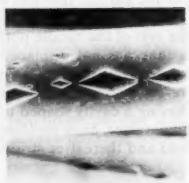
re-using said hard, heat-resistant, finely-roughened metallic plate to produce additional textured high-pressure laminates.

3,928,528

PROCESS FOR PRODUCING ACRYLIC FIBERS HAVING EXCELLENT PILLING RESISTANCE

Zen-ichi Orito; Minoru Uchida; Masatoshi Takesue; Hajime Sahara, and Kihiro Fujii, all of Nagoya, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 146,148, May 24, 1971, Pat. No. 3,802,954. This application Aug. 3, 1973, Ser. No. 385,290
Claims priority, application Japan, May 27, 1970, 45-45502; June 5, 1970, 45-48614; June 8, 1970, 45-49308; June 12, 1970, 45-50834
Int. Cl.² B29C *25/00;* **D06M** *3/26*
U.S. Cl. 264—344 **9 Claims**



1. A process for producing acrylic fibers having a plurality of elongated wedge shaped concave depressions extending into the surface thereof, the number of said depressions being more than 3 per inch along the length of an individual fiber and the elongated axis of said depressions being axially aligned in the lengthwise direction of the fiber, which comprises pretreating acrylic fibers with a modifier selected from the group consisting of alkali metal hydroxides, sulfuric acid and hydroxylamine salts to modify the outer portion of individual fiber to make the outer portion of individual fiber insoluble in dimethyl formamide at 100°C. and then after-treating the fibers with an organic treating agent which is non-solvent for the modified outer portion, but is solvent for the unmodified inner portion of the acrylic fibers and which is selected from the group consisting of dimethyl formamide, dimethyl acetamide, dimethyl sulfon, dimethyl sulfoxide, ethylene carbonate, acetonitrile, malonitrile and adiponitrile.

3,928,529

PROCESS FOR RECOVERING HCl AND Fe_2O_3 FROM PICKLE LIQUOR

Carl A. Grulke, deceased, late of Berea, Ohio (by Elizabeth N. Grulke, executrix), assignor to Union Carbide Corporation, New York, N.Y.

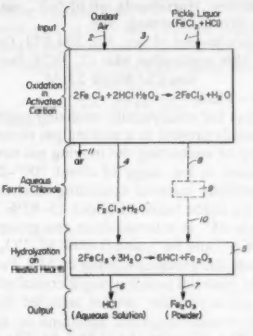
Continuation-in-part of Ser. No. 171,441, Aug. 13, 1971, abandoned. This application Mar. 9, 1973, Ser. No. 339,890
Int. Cl.² C01G *49/06;* **C01B** *7/08*
U.S. Cl. 423—138 **11 Claims**

1. A process for the regeneration of an aqueous solution of ferrous chloride and hydrochloric acid for the recovery of hydrochloric acid values along with iron oxide comprising the stages:

a. oxidizing at a temperature between about ambient temperature and about 110°C an aqueous solution of ferrous chloride and hydrochloric acid with an oxidant in contact with activated carbon to form a reaction-product of aqueous ferric chloride;

b. increasing the temperature of said reaction-product of aqueous ferric chloride to between about 115° and about 275°C to substantially hydrolyze it to hydrochloric acid

vapor and hydrated iron oxide, said hydrated iron oxide accumulating on a substrate in layer form;



c. recovering the hydrochloric acid formed in stage (b); and

d. recovering the iron oxide.

3,928,530

SELECTIVE PRECIPITATION OF COBALT AND NICKEL AMINE COMPLEXES

Herman F. Bakker, Clarkson, Canada, and Malcolm C. Bell, Sudbury, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 380,562, July 19, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,817

Int. Cl.² C01G *51/12;* **C22B** *23/04*

U.S. Cl. 423—140 **7 Claims**

1. A process for precipitating cobalt values from an aqueous ammine solution comprising providing an aqueous solution containing about 0.5 to about 50 gpl of divalent cobalt, about 0.5 to about 50 gpl of nickel, a complementary amount of chloride ion stoichiometrically equivalent to the nickel and cobalt in the divalent state, ammonia in a molar amount of about 3 to about 8 times the molar amount of total nickel plus cobalt and about 10 to about 350 gpl of ammonium chloride, the amounts of the ammonia and ammonium chloride being controlled such that all the nickel and divalent cobalt are soluble in the aqueous solution, oxidizing cobalt in said solution to the trivalent state using a gaseous oxidant containing molecular oxygen and precipitating trivalent cobalt chloropentammine chloride by maintaining the temperature of said aqueous ammine solution at about 60° to about 120°C. during the precipitation operation.

3,928,531

BLACK LIQUOR OXIDATION PROCESS

William H. Boatwright, and Thomas C. Hsu, both of Covington, Va., assignors to Westvaco Corporation, New York, N.Y.

Filed Mar. 18, 1974, Ser. No. 451,764

Int. Cl.² C01D *5/00;* **D21C** *11/14*

U.S. Cl. 423—206 **6 Claims**

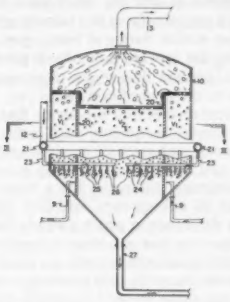
1. A method of intimately contacting a flowing quantity of cellulose pulping liquor with a quantity of oxidizing gas, said method comprising the steps of:

A. Providing a substantially unpressurized fluid retention vessel having a horizontal sectional area divided into at least two retention volumes;

B. Supplying concentrated spent cellulose pulping liquor to a first of said retention volumes;

C. Discharging said liquor from a second of said retention volumes;

D. Distributing substantially all of an oxidizing gas over substantially all of said horizontal sectional area at one end of said retention volumes for flow traverse along the length of said volumes toward the other end thereof in direct contact with said liquor; and,



E. Conducting said liquor flow along the substantial length of each of said retention volumes between said supply and discharge.

3,928,532

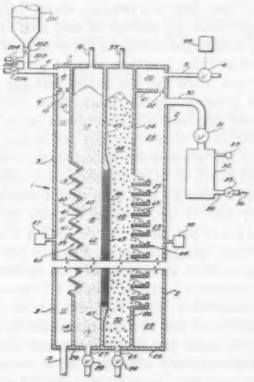
TREATING GAS WITH CHEMICALLY REACTIVE DUST IN PANEL BED

Arthur M. Squires, 245 W. 104 St., New York, N.Y. 10025

Filed Sept. 19, 1974, Ser. No. 507,386

Int. Cl.² B01D *53/34*

U.S. Cl. 423—210 **13 Claims**



1. The method of treating a gas including its contacting with a fine chemically reactive granular medium, comprising:

a. arranging granular material smaller than about **40** mesh in a panel bed having a plurality of transversely disposed upwardly spaced gas entry portions separated by interposed supporting members having outer and inner edges with respect to the bed wherein said gas entry portions have gas entry faces substantially contiguous with said outer edges and wherein said bed has gas exit portions spaced from said inner edges;

b. forwardly flowing gas through the gas entry portions of

the granular material bed and outwardly from the gas exit portions while adding to said gas a chemically reactive granular medium substantially smaller than about 120 mesh to separate and accumulate said medium in surface layer deposits at said gas entry faces wherein said gas enters said gas entry faces at a velocity greater than about 16 feet per minute during at least a part of this step (b);

c. stopping the forward flow of said gas of step (b);

d. causing a transient flow of gas to move in the direction in reverse to the flow of said gas in (b);

e. said transient reverse flow producing first a rise at a given rate of rise and subsequently a fall in the pressure difference between said gas exit portions and said gas entry portions, said difference remaining greater than a first critical minimum difference for a time interval of less than about 50 milliseconds, said first critical difference being that difference at which a steady flow of gas in said reverse direction just produces a localized spill of said first granular material from said gas entry faces, and said difference produced by said transient reverse flow peaking to a top value beyond a second critical minimum difference, which is the pressure difference at which a transient flow of gas in said reverse direction producing said pressure difference at said rate of rise just initiates a body movement of said first granular material toward said gas entry faces to spill a portion of the granular material and substantially all of said accumulated chemically reactive granular medium from the bed;

f. supplying fresh granular material to replace material spilled from said gas entry portions;

g. repeating the cycle of said steps (b), (c), (d), (e), and (f) at least two times;

h. forwardly flowing gas through the gas entry portions of the granular material bed and outwardly from the gas exit portions while adding to said gas a first increment of said chemically reactive granular medium at a rate of addition less than about 5 grams per cubic meter of said gas to separate and accumulate said medium in surface layer deposits at said gas entry faces wherein said gas enters said gas entry faces at a first velocity greater than about 16 feet per minute until the pressure drop across said surface layer deposits reaches about 0.05 centimeters of water per foot per minute of said first velocity and then adding to said gas a second increment of said medium at a rate of addition less than about 5 grams per cubic meter of said gas while the gas enters said gas entry faces at a second velocity greater than about 16 feet per minute until said pressure drop increases by at least about 0.1 centimeters of water per foot per minute of said second velocity and wherein subsequently the rate of flow of said gas is reduced so that the gas enters said gas entry faces at a third velocity less than about one-half of said first velocity and of said second velocity and also less than about 16 feet per minute while adding to said gas at a rate of addition less than about 5 grams per cubic meter of said gas a third increment of said medium wherein said third increment is at least about 1.5 times as large as said second increment when said pressure drop increased with the addition of said second increment by about 0.1 centimeters of water per foot per minute and wherein, when said pressure drop increased by a substantially greater amount, said third increment is at least about 1.5 times as large as the pro rata portion of said second increment that was responsible for an increase of exactly 0.1 centimeters of water per foot per minute;

i. stopping the forward flow of said gas of step (h) and forwardly flowing gas to be treated at a rate to enter said gas entry faces at a velocity not substantially greater than said third velocity and thereby treating said gas by contact with said surface layer deposits of said chemically reactive medium;

j. stopping the forward flow of said gas of step (i); and

k. repeating steps (d), (e), (f), (h), (i), and (j) in a cyclic manner.

3,928,533

BASE METAL TITANATE CATALYSTS

George H. Beall, Big Flats; David M. Miller, Elmira, and Hermann L. Rittler, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 294,074, Oct. 2, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 448,834

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—213.2 **6 Claims**

1. A process for catalytically oxidizing hydrocarbons and carbon monoxide present in a moving gas stream which comprises the step of contacting the moving gas stream at a catalyst temperature in the range of about 700°–2000°F. with a crystalline catalytic material consisting essentially, in weight percent on the oxide basis, of about 15–85% TiO_2, 15–70% $M''O$, wherein M'' is selected from the group consisting of Mn^{+2}, Co^{+2}, Cu^{+2} and Fe^{+2}, and 0–60% $M_2'''O_3$, wherein M''' is selected from the group consisting of Al^{+3}, Fe^{+3}, Mn^{+3}, Cr^{+3} and Co^{+3}, said material having a major crystal phase consisting of at least one crystalline species selected from the group consisting of titaniferous solid solutions of spinel ($M_2''TiO_4$—$M''M_2'''O_4$), ilmenite ($M''TiO_3$—$M_2'''O_3$) and pseudobrookite ($M''Ti_2O_5$— $M_2'''TiO_5$) structure.

3,928,534

CATALYST USEFUL AT HIGHER TEMPERATURES, ESPECIALLY FOR PURIFICATION OF EXHAUST GASES FROM MOTOR VEHICLES AND INDUSTRIAL PLANTS

Edgar Koberstein, Alzenau, and Eduard Lakatos, Hurth-Hermulheim, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Germany

Division of Ser. No. 64,957, Aug. 19, 1970, Pat. No. 3,669,906, which is a continuation-in-part of Ser. No. 581,163, Sept. 22, 1966, abandoned. This application Feb. 18, 1972, Ser. No. 227,629

Int. Cl.[2] B01D *53/00*

U.S. Cl. 423—213.2 **11 Claims**

1. A method for purifying exhaust gases from motor vehicles containing residual impurities from the group consisting of hydrocarbon and a mixture of nitrogen oxide and carbon monoxide which comprises contacting said exhaust gas at elevated temperatures in the presence of air with an oxidation catalyst consisting essentially of the calcined mixture of (1) eta and gamma aluminum oxide, (2) heavy metal oxide compounds containing the element chromium and at least one other heavy metal selected from the group consisting of (a) nickel and (b) copper with nickel, and (3) at least one compound of an element of Group IIA of the periodic system, the quantity of such heavy metal oxide compounds being 55 to 90 weight percent, the molar proportions of the chromium to the other heavy metal being between about 1:0.5 and 1:2.5 calculated as oxides and the majority of the particles of the heavy metal oxide compounds being of a size of from 0.5 to 5 microns, the quantity of Group IIA element being 0.5 to 10 weight percent of the heavy metal compound plus Group IIA element calculated as oxides, the heavy metal oxide compounds and compound of Group II A element having been formed by precipitating from a solution of ammonium bichromate with a soluble salt of said other heavy metal or metals and a soluble salt of said element of Group IIA and whereby said calcining of said mixture having been done at 400°–800°C, in an oxygen-containing atmosphere.

3,928,535

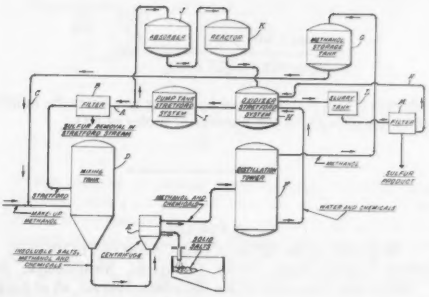
SULFUR RECOVERY SYSTEM

Paul G. Schulz, Maumee, Ohio, assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 352,758, April 19, 1973, abandoned, and a continuation-in-part of Ser. No. 438,054, Jan. 30, 1974, abandoned. This application Mar. 18, 1974, Ser. No. 452,493

Int. Cl.² B01D *53/34*

U.S. Cl. 423—224 15 Claims



1. A process for reducing the concentration of dissolved by-product alkali metal or ammonium thiosulfate or sulfate salts in aqueous H_2S removal systems containing a dissolved quinone type oxidation-reduction component which is recycled in said system and which is sensitive to precipitants for said by-product salts, which comprises mixing methanol with a solution containing said by-product salts and said sensitive oxidation-reduction component in a volume ratio of methanol to said aqueous solution of from about 25:75 to about 65:35, thereby precipitating said by-product salts but not said oxidation-reduction component, and separating said precipitated salts from said solution.

3,928,536

PROCESSES FOR REMOVAL OF SULFUR DIOXIDE FROM GASES

George W. Lewis, Jr., 8138 Lockwood Lane, Indianapolis, Ind. 46217

Filed Mar. 14, 1973, Ser. No. 340,963

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 13 Claims

1. A dry process for reducing SO_2 content of gases containing SO_2, ammonia and water vapor which comprises:

a. passing gases containing SO_2, ammonia and water vapor past a solid heat sink having a surface area maintained below the temperature of the gases,

1. the velocity of the gases passed past the heat sink being sufficiently slow and

2. the temperature of the heat sink being maintained such that solid compounds of SO_2, ammonia and water precipitate onto the surface of the heat sink.

mechanically removing solids accumulating on the heat sink.

3,928,537

METHOD OF REMOVING SULFUR DIOXIDE FROM COMBUSTION EXHAUST GAS

Shigeru Saitoh; Tetsuya Watanabe; Koji Konno; Kunihide Yaguchi; Kenji Kodama, and Tamotsu Miyamori, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 7, 1974, Ser. No. 440,381

Claims priority, application Japan, Feb. 10, 1973, 48-16919

Int. Cl.² C01B *17/00*

U.S. Cl. 423—243 4 Claims

1. A method of removing sulfur dioxide from combustion exhaust gas containing said sulfur dioxide, comprising contacting said combustion exhaust gas with an aqueous solution containing at least one organic acid salt selected from the group consisting of alkali metal salts or ammonium salts of acetic acid, propionic acid and butyric acid to dissolve the sulfur dioxide contained in the combustion exhaust gas in the form of alkali sulfite and alkali sulfate in said aqueous solution and to generate organic acid in said aqueous solution, adding into the resultant solution which contains alkali sulfite, alkali sulfate and organic acid dissolved therein a calcium compound selected from the group consisting of calcium carbonate, calcium oxide, calcium hydroxide and calcium salt of an organic acid for reaction of said alkali sulfite and said alkali sulfate contained in said solution with said calcium compound to produce calcium sulfite and calcium sulfate which precipitate in said solution resulting in formation of said organic acid salt in said solution, and recycling the organic acid saltcontaining solution obtained after separation of said calcium sulfite and said calcium sulfate for contact with said combustion exhaust gas.

3,928,538

PROCESSING OF URANIUM HEXAFLUORIDE INCLUDING ABSORPTION OF URANIUM HEXAFLUORIDE IN AQUEOUS ALUMINUM NITRATE

Ernest Lillyman; Frank Charles Mascall, both of Thurso, and Cecil George Mathers, Halkirk, all of Scotland, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 29, 1973, Ser. No. 410,354

Claims priority, application United Kingdom, Nov. 8, 1972, 51500/72

Int. Cl.² C01G *43/02*

U.S. Cl. 423—260 2 Claims

1. A process in which uranium hexafluoride vapour enriched in U235 is absorbed in aqueous aluminium nitrate solution to complex the fluoride, the aqueous solution is brought into contact with an organic solvent for preferentially extracting uranium from the aqueous solution and the organic solvent is washed with dilute nitric acid to produce an aqueous uranyl nitrate solution.

3,928,539

METHOD FOR CONTINUOUSLY PRODUCING HYDRATED CALCIUM SILICATES

Hirokazu Satoh; Hidesato Takeuchi, and Shigeki Oikawa, all of Tokyo, Japan, assignors to Onoda Chemical Industry Company, Limited, Tokyo, Japan

Filed Jan. 7, 1974, Ser. No. 431,222

Int. Cl.² C01B *33/20*, *33/24*

U.S. Cl. 423—326 9 Claims

1. A method for producing hydrous calcium silicates continuously, which comprises:

1. heating a siliceous raw material and a calcareous raw material which is prepared with a SiO_2 : CaO molar ratio of about 1.00 : 0.6–1.3, with water so as to form an aqueous slurry until at least 50% of the total CaO and SiO_2 in the starting materials has been gelled by reaction at 50–100°C;

2. heating the gelled product of step (1) to above 160°C in less than 30 minutes by means of pressurized water of

high temperature, maintaining this temperature for about 0.5 to 4 hours; and

3. continuously discharging the reaction product.

3,928,540

PROCESS FOR PREPARING SILICA PIGMENT

James E. Morgan, Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 164,843, July 26, 1971, abandoned. This application Feb. 8, 1974, Ser. No. 440,942

Int. Cl.² C01B *33/18*; C09C *1/28*

U.S. Cl. 423—339 **20 Claims**

1. A method for producing finely-divided precipitated silica, which comprises acidifying an aqueous solution of alkali metal silicate with acidifying agent in an amount sufficient to precipitate finely-divided silica and thereby form a first aqueous slurry of silica, said slurry having reached a viscosity in excess of 550 centipoises, adding from 10 to 200 weight percent of further aqueous alkali metal silicate, based on the initial alkali metal silicate solution, to the slurry, adding further acidifying agent to the slurry in an amount sufficient to precipitate further finely-divided silica, and recovering the precipitated silica.

3,928,541

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS FOR COSMETIC OR DENTRIFRICE USE AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Filed Sept. 5, 1972, Ser. No. 285,966The portion of the term of this patent subsequent to July 8, 1992, has been disclaimed.

Int. Cl.² C01B *33/18*, *33/00*; C04B *31/02*

U.S. Cl. 423—339 **1 Claim**

1. A new composition of matter comprising an amorphous, finely divided precipitated silica having a wet cake moisture content in the range of between 64 to 70; an oil absorption in the range of from about 91 to 136 cc/100gm; a pack density in the range of from about 17.6 to 25.0 pounds/cu.ft; a valley abrasion in the range of from about 11.6 to 26 mg wire loss; and a surface area in the range of from 52 to 72 m^2/gm.

3,928,542

PROCESS FOR THE PREPARATION OF ANION EXCHANGE RESIN FOR USE IN THE REDISTRIBUTION OF CHLOROSILANES

Carl James Bakay, Marietta, Ohio, assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,321

Int. Cl.² C01B *33/08*

U.S. Cl. 423—342 **1 Claim**

1. In the process of disproportionation or redistribution of trichlorosilane, dichlorosilane or monochlorosilane in an amino anion exchange resin bed at a temperature of between about 100°C. to as high as about 350°C., by feeding said silanes to said anion exchange resin bed, the improvement which comprises pretreating said bed in an inert water immiscible liquid with anhydrous hydrogen chloride until at least one equivalent thereof is taken up by said bed.

3,928,543

MANUFACTURE OF NITRITES

Donald Dale Gregory, Wilmington, Del., and Martin Maurice Wendel, Glen Mills, Pa., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 213,930, Dec. 30, 1971, abandoned. This application Dec. 20, 1973, Ser. No. 426,654

Int. Cl.² C01B *21/50*

U.S. Cl. 423—385 **16 Claims**

1. A process for producing in a batch or continuous manner an aqueous solution of a nitrite of an inorganic cation selected from the group consisting of ammonium, alkali metal cations, and alkaline earth metal cations by using a base selected from hydroxides and carbonates of the selected cation, said process comprising the steps of

1. passing a gaseous mixture containing oxides of nitrogen having a state of oxidation of less than 70 percent into contact with said base to cause a reaction of the base with said oxides of nitrogen and
2. adding continuously or in stages, as said reaction proceeds, an inert diluent gas to the gaseous mixture being passed in step (1) to reduce progressively the concentration of oxides of nitrogen in said gaseous mixture as the concentration of said base in said solution is reduced, said state of oxidation being defined as

$$\frac{\text{moles e } NO_2}{\text{moles NO} + \text{moles e } NO_2} \times 100$$

wherein e NO_2 is determined by adding two times the number of moles of N_2O_4 to the number of moles of NO_2.

3,928,544

PROCESS FOR PRODUCING CARBON PRODUCTS

Hisao Yokota, Kobe; Akira Kobayashi, Nishinomiya; Jiro Horikawa, Suita, and Akira Miyashita, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Mar. 5, 1973, Ser. No. 337,856

Claims priority, application Japan, Mar. 6, 1972, 47-23020

Int. Cl.² C01B *31/02*, *31/07*

U.S. Cl. 423—447 **10 Claims**

1. A process for producing carbon products which comprises (1) forming a polymer selected from the group consisting of polystyrene, polychlorostyrene, polydimethylstyrene, polychloromethylstyrene, polyvinylnaphthalene, polyvinylanthracene, polyvinylpyridine and poly-N-vinylcarbazole into a fiber having a diameter of 1 to 500 μ or a film having a thickness of 5 to 1000 μ, (2) subjecting the fiber or film to sulfonation, chlorosulfonation, nitration or bromination sufficient to make the polymer infusible, and (3) carbonizing the resultant infusible product by heating to give carbon fibers or filmy carbon.

3,928,545

ZIRCONIUM COMPLEXES OF BASIC ALUMINUM CHLORIDES AND METHODS OF MAKING SAME

John L. Jones, North Plainfield; Andrew M. Rubino, New Providence, both of N.J., and Charles B. Lindahl, Sand Springs, Okla., assignors to Armour Pharmaceutical Company, Chicago, Ill.

Filed July 20, 1971, Ser. No. 164,434

Int. Cl.² C01G *25/04*; C01F *7/00*, *7/48*

U.S. Cl. 423—463 **7 Claims**

1. A method of preparing alcohol soluble solid complexes of 5/6 basic aluminum chlorides comprising the steps of providing an aqueous solution of 5/6 basic aluminum chloride having the general empirical formula:

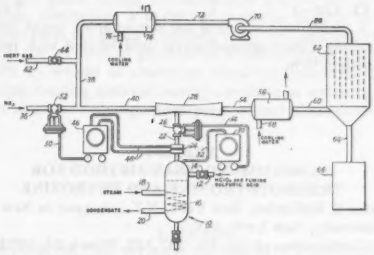
$$Al_2(OH)_{6-x}Cl_x$$

in which x equals about 0.9 to 1.2; adding to said aqueous solution a substance selected from the group consisting of zirconyl hydroxybromide and a combination thereof with zirconyl bromide; said substance being added in an amount sufficient to yield an Al/Zr mole ratio of about 3:1 to 20:1; and drying the resulting mixture to a substantially friable solid.

3,928,546
METHOD AND APPARATUS FOR MAKING AMMONIUM PERCHLORATE

Anthony T. Guzzo, Huntsville, Ala., assignor to Thiokol Corporation, Bristol, Pa.

Filed Dec. 11, 1970, Ser. No. 97,100
Int. Cl. C01b *11/16*
U.S. Cl. 423—476 **7 Claims**



1. The method of making ammonium perchlorate which comprises causing a stream of inert gas to flow in a closed cycle, adding gaseous ammonia to said inert gas stream at a first point in said cycle, adding substantially anhydrous perchloric acid vapor to said stream at a second point in said cycle to cause said perchloric acid vapor to react with said ammonia to form finely particulate ammonium perchlorate particles, and separating said ammonium perchlorate particles from said stream at a third point in said cycle.

3,928,547
PROCESS FOR THE REDUCTION OF SULFUR DIOXIDE

William D. Daley, Morristown; John E. Wilkalis, Morris Plains, and Wim J. M. Pieters, Morristownship, all of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 267,863, June 30, 1972, abandoned. This application June 10, 1974, Ser. No. 477,893
Int. Cl.² C01B *17/04*
U.S. Cl. 423—564 **17 Claims**

1. In a process for the catalytic reduction of sulfur dioxide to elemental sulfur by reacting a gaseous mixture of a sulfur dioxide-containing gas and a hydrocarbon reducing agent at elevated temperatures, the improvement comprising effecting initiation of said reduction reaction in the presence of 0.05 to 3 mol percent elemental sulfur vapor, expressed as S_n, wherein the volume of the mixture of the sulfur dioxide-containing gas and hydrocarbon reducing agent in the presence of said elemental sulfur is not appreciably increased and the reduction is carried out at temperatures within the range of 850° to 2,400°F.

3,928,548
PROCESS FOR PURIFYING A SULFUROUS ANHYDRIDE CONTAINING GAS AND PRODUCING ELEMENTAL SULFUR

André Deschamps, Chatou; Philippe Renault, Noisy-le-Roi, and Claude Dezael, Maisons-Laffitte, all of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Paris, France

Filed Sept. 17, 1973, Ser. No. 397,971
Claims priority, application France, Sept. 22, 1972, 72.33814; Jan. 11, 1973, 73.00975
Int. Cl.² C01B *17/04*
U.S. Cl. 423—575 **7 Claims**

1. A process for purifying a gas containing sulfurous anhydride and 0.5–10% by volume of oxygen, while producing elemental sulfur, said process comprising: in a first stage contacting the gas at 20°–130°C with an absorbing solution of urea, thiourea or an alkali metal or ammonium salt of benzoic acid or of an alkyl-, cycloalkyl- or aryl-phosphoric acid in a mixture of water and polyethylene glycol having a molecular weight of about 200–600, so as to absorb the sulfurous anhydride in said absorbing solution, separating resultant sulfurous ahnydride containing absorbing solution from the gas containing 0.5–10% by volume of oxygen, and, in a second stage contacting resultant separated solution at 20°–130°C with a gas containing hydrogen sulfide, substantially in the absence of oxygen, so as to produce sulfur and to regenerate the absorbing solution used in the first stage.

JFW

3,928,549
THERMOCHEMICAL PRODUCTION OF HYDROGEN

Oscar H. Krikorian, Danville, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 20, 1974, Ser. No. 481,263
Int. Cl.² C01B *1/02*
U.S. Cl. 423—648 **11 Claims**

1. A closed cycle process for the thermochemical production of hydrogen from water which comprises:
   a. hydrolyzing a hydrolyzable compound of a metal and a metalloidal element selected from the group consisting of arsenic, antimony, bismuth, selenium, and tellurium, thereby producing the corresponding metal oxide or hydroxide and a compound of hydrogen and the metalloidal element;
   b. thermally decomposing the compound of hydrogen and the metalloidal element, thereby producing hydrogen and the metalloidal element;
   c. reacting the metalloidal element with the metal oxide or hydroxide, thereby regenerating the compound of the metal and the metalloidal element and producing an oxide of the metalloidal element;
   d. reducing the oxide of the metalloidal element with a thermally regenerable reducing agent, thereby regenerating the metalloidal element and oxidizing the reducing agent; and
   e. thermally decomposing the oxidized reducing agent, thereby regenerating the reducing agent and producing oxygen.

11. A closed cycle process for the thermochemical production of hydrogen which comprises:
   a. reacting copper selenide with sulfuric acid, thereby producing copper sulfate, hydrogen, and selenium;
   b. thermally decomposing the copper sulfate, thereby producing copper oxide, sulfur dioxide, and oxygen;
   c. reacting the copper oxide with selenium, thereby regenerating the copper selenide and producing selenium dioxide; and
   d. reducing the selenium dioxide with sulfur dioxide in aqueous solution, thereby producing selenium and regenerating sulfuric acid.

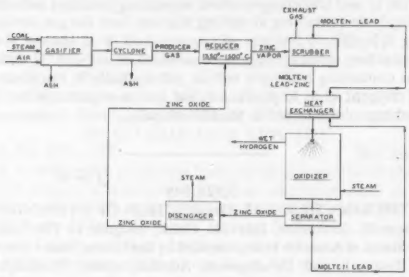
3,928,550
PROCESS FOR MAKING HYDROGEN

Walter H. Seitzer, West Chester, Pa., assignor to Sun Ventures, Inc., St. Davids, Pa.

Filed Sept. 12, 1974, Ser. No. 505,436
Int. Cl.² C01B *1/02, 1/08*; C01G *9/02*
U.S. Cl. 423—657 **5 Claims**

1. A process for making hydrogen which comprises contacting zinc oxide at 1,350° to 1,500°C. with a reducing gas to reduce said zinc oxide to zinc metal, contacting the metallic zinc with molten lead which is inert under process conditions to obtain a solution of zinc in lead containing from about 10% to about 50% by weight and spraying the solution under pressure to an oxidizer where metallic zinc is reacted at a temperature of from about 600° to about 900°C. and at about 1,000

to 3,000 psig with steam to yield hydrogen and zinc oxide, separating the hydrogen product under pressure, separating



the zinc oxide from the molten lead, recycling zinc oxide for reduction to zinc and recycling the lead for further use.

3,928,551

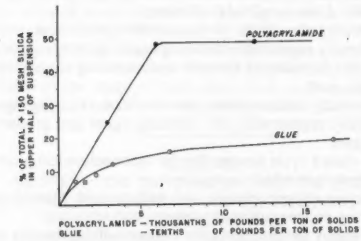
LEACHING POLYELECTROLYTE FLUIDIZED SOLIDS

Robert Ben Booth, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 58,388, July 27, 1970, Pat. No. 3,746,641, which is a continuation-in-part of Ser. No. 179,287, March 7, 1962, Pat. No. 3,524,682, which is a continuation-in-part of Ser. No. 698,429, Nov. 25, 1957, abandoned. This application Nov. 17, 1972, Ser. No. 307,667

Int. Cl. C01B */00;* **C01C** */00;* **C01D** */00;* **C01F** */00;* **C01G** */00;* **C22B** */00*

U.S. Cl. 423—659 **5 Claims**



1. In the leaching of a suspension of solids in water in which the solids range from comparatively coarse, including particles larger than 65 mesh, to very fine materials, including particles smaller than 325 mesh, and which suspension, at least when allowed to settle, has a high solids content of at least about 30% solids, and which suspension in the absence of a suspending agent, when in a quiescent state separates with the formation of a solid cake, which stalls agitators and resists resuspension, the step which comprises: adding to said water suspension of solids a small but effective amount of a water soluble polyelectrolyte suspending agent, from 0.005 to 5 pounds per ton of suspended solids, which is an ampholytic linear carbon chain vinyl polymer consisting essentially of recurring carbamylethylene and carboxyethylene linkages and not more than a minor amount of nitriloethylene linkages, and salts thereof, having a weight average molecular weight in excess of 100,000, thereby producing a suspension which is of uniform characteristics and from which the solids drop out as an unclassified readily resuspendable material, said polymer increasing the viscosity of the aqueous phase, insuring laminar flow at higher velocities, thereby reducing pumping power requirements, and simultaneously stabilizing the suspension, so that during interruptions in agitation, the suspension remains fluidized, and in pumpable condition.

3,928,552

HEPATO-BILIARY RADIOPHARMACEUTICAL COMPRISING 2-MERCAPTOISOBUTYRIC ACID CHELATING REDUCED TECHNETIUM-99M

Harry S. Winchell, Lafayette; Archie S. Khentigan, San Francisco, and Hong Lin, Berkeley, all of Calif., assignors to Medi-Physics, Inc., Emeryville, Calif.

Filed Oct. 18, 1973, Ser. No. 407,409

Int. Cl. A61k *27/04;* **C07f** *7/22;* **G01t** *1/00*

U.S. Cl. 424—1 **7 Claims**

1. A radiopharmaceutical for scintigraphic organ imaging comprising 2-mercaptoisobutyric acid labeled with reduced technetium-99m.

3,928,553

RADIOIMMUNOASSAY METHOD FOR TRIIODOTHYRONINE AND THYROXINE

Charles S. Hollander, New York, N.Y., assignor to New York University, New York, N.Y.

Continuation of Ser. No. 237,342, March 23, 1972, abandoned. This application Feb. 25, 1974, Ser. No. 445,115

Int. Cl.[2] A61K *43/00;* **G01T** *33/00, 1/16;* **G21H** *5/02*

U.S. Cl. 424—1 **21 Claims**

1. A radioimmunoassay method for triiodothyronine or thyroxine or triidodthyronine and thyroxine present in unextracted serum containing thyroxine binding pre-albumin and thyroxine binding globulin which comprises:

a. adding to unextracted serum, a sufficient amount of a binding inhibitory agent to substantially inhibit binding of triiodothyronine or thyroxine or triiodothyronine and thyroxine to the thyroxine binding prealbumin;

b. adding to the serum an amount of an isotopically labelled triiodothyronine or thyroxine or triiodothyronine and thyroxine sufficient for detection;

c. adding to the serum, a sufficient amount of a binding inhibitory agent to substantially inhibit binding of triiodothyronine or thyroxine or triiodothyronine and thyroxine to the thyroxine binding globulin;

d. adding to the serum an amount of antiserum containing antibody for triiodothyronine or thyroxine or triiodothyronine and thyroxine which is approximately proportionate to the titer;

e. incubating the serum at a temperature and for a period of time which is sufficient to provide substantial equilibration of the antibody bound and unbound triiodothyronine or thyroxine or triiodothyronine and thyroxine;

f. separating the unbound triiodothyronine or thyroxine or triiodothyronine and thyroxine from the bound triiodothyronine or thyroxine or triiodothyronine and thyroxine while substantially preventing re-equilibration of antibody bound triiodothyronine or thyroxine or triiodothyronine and thyroxine; and

g. measuring the adsorbed unbound triiodothyronine or thyroxine or triiodothyronine and thyroxine and the bound triiodothyronine or thyroxine or triiodothyronine and thyroxine.

3,928,554

EMULSION DYEING

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Incorporated, Cambridge, Mass.

Filed Dec. 19, 1973, Ser. No. 426,356

Int. Cl.[2] G01N *1/00, 1/30*

U.S. Cl. 424—3 **14 Claims**

1. A dyebath for histological staining comprising;

an emulsion having a dispersed phase in a suspending aqueous medium, the dispersed phase including at least one dye dissolved in a solvent which is substantially immiscible with said medium.

3,928,555

SPECKLE PARTICLE FOR DENTIFRICE

Ian Ray Gault, Lymm, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 3, 1973, Ser. No. 385,296
Int. Cl.² A61K 9/24
U.S. Cl. 424—22 7 Claims

1. Finely divided visible functional particles, which alleviate periodontal sensitivitity and bleeding upon application to teeth and gums having a macroscopic size of 100 to 1000 microns, comprising a matrix of meltable binding material selected from the group consisting of C_{12} to C_{22} saturated fatty acid di- or tri-ester of glycerol or ethylene glycol and about 5–10% by weight of aluminum dihydroxy allantoinate said meltable binding material having a melting or softening point lower than the decomposition point of said allantoinate.

3,928,556

NON-STINGING WOUND DRESSING CONTAINING TERTIARY BUTYL ALCOHOL

Ulf Allan Sweger, Marbella, Spain, assignor to Novitas Nuprot SA, Freibourg, Switzerland

Filed Feb. 28, 1974, Ser. No. 447,032
Claims priority, application Sweden, Mar. 2, 1973, 73029498
Int. Cl.² A61K 31/02, 31/12, 31/22, 31/74
U.S. Cl. 424—45 22 Claims

1. A non-stinging wound dressing comprising film forming plastic material dissolved in a solvent system, said solvent system containing 70% or more non-stinging solvent, said non-stinging solvent consisting of tertiary butyl alcohol and solvent selected from the group comprising straight and branched chain saturated hydrocarbons having 5–8 carbon atoms, saturated cyclic hydrocarbons having 5–8 carbon atoms and chlorofluoro substituted saturated hydrocarbons containing 1–2 carbon atoms and mixtures thereof wherein the non-stinging solvent contains 50% or more tertiary butyl alcohol, said film forming plastic material selected from the group comprising, N-butyl methacrylate, isobutyl methacrylate, 2-ethoxyethyl methacrylate, methyl methacrylate, polyvinyl butyral, ethyl cellulose, polyvinyl ethyl ether, polyisobutylene polymers and 80/20 isobutyl methacrylate/N-butyl methacrylate and 95/5 2-ethoxyethyl methacrylate/methyl methacrylate copolymers, said film forming plastic material being skin adherent and washable upon drying.

3,928,557

DEODORANT FORMULATIONS AND ANTIPERSPIRANT FORMULATIONS CONTAINING PARTICULAR ALIPHATIC DIOLS AND THEIR ESTERS

Donald L. Wright, New York, N.Y., and John W. Frankenfeld, Atlantic Highlands, N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Oct. 28, 1970, Ser. No. 84,931
Int. Cl.² A61K 7/32, 7/38, 31/23
U.S. Cl. 424—47 4 Claims

1. In an antiperspirant and deodorant composition containing from about 5 to 30% by weight of an astringent wherein the improvement comprises from about 2% by weight to about 20% by weight of a antibacterial compound selected from the group consisting of esters of saturated normal aliphatic 1,3-diols with monocarboxylic acids of saturated normal aliphatic hydrocarbons said esters having 4 to 15 carbon atoms in the diol portion of the molecule and 2 to 20 carbon atoms in the acyl portion of the molecule.

3,928,558

HAIRSPRAY COMPOSITIONS CONTAINING A SILICONE GLYCOL BLOCK COPOLYMER

Jean Ann Cheesman, Whitton, and Cherry Pamela Coles, West Ewell, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed May 29, 1973, Ser. No. 364,210
Claims priority, application United Kingdom, May 26, 1972, 25111/72
Int. Cl.² A61K 7/10
U.S. Cl. 424—47 5 Claims

2. An aerosol hairspray composition suitable for imparting a set to hair comprising in solution in a mixture of from about 10% to 70% by weight of an organic solvent selected from the group consisting of ethanol, isopropanol, methylene chloride, methoxyethanol and 2-ethoxyethanol and from about 30% to about 90% by weight of a liquefied normally gaseous propellant,

a. from about 0.1% to about 7.5% by weight of the composition of a film-forming resin for imparting a set to hair; and
b. from about 0.5% to about 15% by weight of said film-forming resin of a polydimethylsiloxane-polyoxyalkylene block copolymer.

wherein each oxyalkylene group is selected from the group consisting of oxyethylene and oxypropylene, said block copolymer comprising dimethylsiloxane ($-Si(CH_3)_2O-$) units and units of the formula $-Si(CH_3)[(CH_2)_x(OCH_2CHR')_pOR-]O-$ where n is selected from the values of 0 and 3, each R′ is selected from the group consisting of hydrogen and methyl, p represents the average number of oxyalkylene groups and R is selected from the group consisting of hydrogen and alkyl containing 1 to 5 carbon atoms, and said block copolymer having a silicon content of from 15% to 25% by weight, a molecular weight of from 1200 to 5000 and a viscosity at 25°C of from 3 to 10 poises.

3,928,559

DENTAL CREAM

Armando Patino, Mexico City, Mexico, and Bernardo Maldonado, Satelite Edo, both of N. Mex., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 256,309, May 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 146,802, May 25, 1971. This application Nov. 2, 1973, Ser. No. 412,444The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.
Int. Cl.² A61K 7/16
U.S. Cl. 424—49 2 Claims

1. Method for providing a speckled appearance to a toothpaste formulation containing at least about 1% by weight of chloroform comprising the sequential steps of:

a. preparing a base toothpaste formulation,
b. adding to said base formulation from about 0.2 to about 1% by weight of macroscopically visible pigmented thermoplastic particles of a desired color,
c. said particles comprising pigmented subparticles in amount adequate to provide said desired color held together by a binding agent, said binding agent being resistant to chloroform & chosen from the synthetic thermoplastic resins having a molecular weight from about 1,000 to about 5,000 & a hardness (ASTM D 1321) of at least about 1,
d. dispersing said particles throughout said formulation,
e. adding said chloroform to the mixture of said formulation and said particles, and
f. blending said chloroform into the mixture of said formulation and said particles.

3,928,560
COMPOSITIONS OF MATTER CONTAINING PARAMETHOXYCINNAMALDEHYDE AS A FLAVORING AGENT AND SWEETENER

James S. Neely, Liberty Township, Butler County, and James A. Thompson, Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 352,813, April 19, 1973, Pat. No. 3,867,557. This application Dec. 11, 1974, Ser. No. 531,642

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **11 Claims**

1. A dentifrice composition comprising:

A. from about 0.0001% to about 2.0% of paramethoxycinnamaldehyde;

B. from about 0.5% to about 5.0% of a sudsing agent;

C. from about 0% to about 1.9999% of a flavoring agent other than paramethoxycinnamaldehyde;

D. from about 0% to about 0.4999% of an additional sweetening agent other than paramethoxycinnamaldehyde;

E. from about 0.5% to about 95% of an abrasive material;

F. from about 0.1% to about 5.0% of a thickening material;

G. up to about 40% of a humectant and viscosity modifying material;

H. up to about 50% water; and

I. from about 0% to about 1.0% of a fluorine containing compound.

3,928,561
COMPOSITION AND METHOD FOR TREATING FINGERNAILS AND TOENAILS

Mildred Baldwin, 1545 Archer Road, Bronx, N.Y. 10462

Continuation-in-part of Ser. No. 392,970, Aug. 30, 1973, Pat. No. 3,887,702. This application June 21, 1974, Ser. No. 481,899

Int. Cl.² A61K *7/04, 7/043*

U.S. Cl. 424—61 **6 Claims**

1. A composition for improving the quality of fingernails and toenails comprising an effective amount of an oil chosen from the group consisting of soybean oil, sunflower oil and combinations thereof comprising from 1 to 19 parts of soybean oil and from 19 to 1 parts sunflower oil, from 200 to 2800 international units of vitamin E per fluid ounce of oil and from 0.1 to 1 cubic centimeters of Liquor Carbonis Detergens per ounce of oil.

3,928,562
POLYMER DERIVATIVE OF β-DIETHYLAMINOETHYL ESTER OF P-AMINOBENZOIC ACID WITH CELLULOSEGLYCOLIC ACID, METHOD OF PRODUCING AND APPLICATION THEREOF

Milda Janovna Pormale, ulitsa Suvorova, 104, kv. 10; Nadezhda Alexandrovna Kashkina, ulitsa Talsu, 9/11, kv. 22; Arvid Janovich Kalninsh, ulitsa Sverdlova, 8, kv. 3; Varvara Nikolaevna Sergeeva, bulvar Rainisa, 11, kv. 2; Janis Alexandrovich Surna, ulitsa M. Kaiju, 3, kv. 3; Janis Shusters, ulitsa Kveles, 15, korpus 4, kv. 30; Modris Janowich Melzobs, ulitsa Veidenbauma, 1/3, kv. 3a; Waldis Danielowich Mikazhan, ulitsa Marupes, 17, kv. 32; Indulis Waldowich Purwinsh, ulitsa Marupes, 17, kv. 35; Antons Petrowich Skutelis, ulitsa Marupes, 17, kv. 32, and Martinsh Aleksandrowich Liepinsh, ulitsa Dzirtsiema, 91, kv. 40, all of Riga, U.S.S.R.

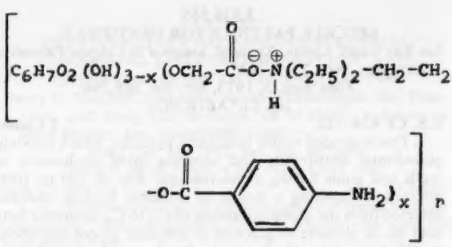
Division of Ser. No. 203,470, Nov. 30, 1971. This application Mar. 21, 1973, Ser. No. 343,377

Claims priority, application U.S.S.R., Jan. 2, 1969, 1207927; Nov. 30, 1970, 1601492

Int. Cl.² A61K *31/74*

U.S. Cl. 424—78 **9 Claims**

1. An anesthetic composition comprising an anesthetically-effective amount of a salt of β-diethylaminoethyl p-aminobenzoate with celluloseglycolic acid having the general formula:



where x is the degree of substitution ranging from 75 to 100; and n is the degree of polymerization ranging from 30 to 120, and a pharmaceutical excipient or vehicle.

3,928,563
SELF-SANITIZING FILM FORMER

Robert H. McIntosh, and Ezekiel H. Hull, both of Greensboro, N.C., assignors to Anthony B. Askew, Atlanta, Ga.

Continuation-in-part of Ser. No. 292,792, Sept. 27, 1972, abandoned, which is a division of Ser. No. 139,265, April 30, 1971, Pat. No. 3,705,235. This application Apr. 22, 1974, Ser. No. 462,717

Int. Cl.² A61K *31/74, 33/24, 31/13*

U.S. Cl. 424—78 **7 Claims**

1. A self-sanitizing film former comprising a mixture of a polyvinylacetate film forming plastic material, emulsified in water, and an effective amount of a sanitizing agent consisting essentially of a nonionic trialkyl amine and a Group II-A or Group II-B metal salt of a monocarboxylic acid having a carbon chain length of 1 to 4.

3,928,564
BIOCIDAL ELASTOMERIC COMPOSITION COMBINATIONS AND METHOD FOR DISPERSING BIOCIDES THEREWITH

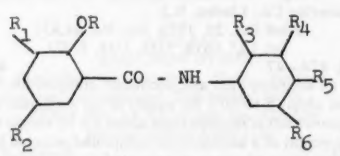
Nathan F. Cardarelli, Copley, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 194,528, Nov. 1, 1971, Pat. No. 3,851,053. This application May 1, 1974, Ser. No. 465,917The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.

Int. Cl.² A61K *31/745*

U.S. Cl. 424—83 **6 Claims**

1. In a method of preparing a biocidal composition comprising dissolving from 0.02 to 20 parts by weight of an organic toxicant selected from the class consisting of organotin compounds of the formula $(R_3Sn)_n X$ wherein n is number from one to three, R is selected from the class consisting of alkyl groups containing 1–20 carbon atoms and aryl groups containing 6–18 carbon atoms, X is a substituent radical attached to the metal atom and is selected from the class consisting of sulfide, oxide, chloride, bromide, fluoride, chromate, sulfate, nitrate, hydroxide, acetate, octanoate, laurate, dimethyl dithiocarbamate, naphthenate, paravinyl, benzoate, acrylate, methacrylate, hydroxide and methoxide; nitrosalicylanilide compounds of the formula



wherein R is selected from the class consisting of hydrogen and lower alkanoyl radicals having 1 to 4 carbon atoms, R_1 is selected from the class consisting of hydrogen and methyl, R_2

is selected from the class consisting of (chlorine, bromine and fluorine, R_3 and R_4 are selected from the class consisting of hydrogen, methyl, halogen and nitro, R_5 and R_6 are selected from the class consisting of hydrogen, halogen, and nitro and wherein the said nitrosalicylanilide compound always contains only one nitro group and at the most, three halogen substituents, and their salts; chlorinated hydrocarbon compounds selected from the class consisting of octachloro-4, 7, methanotetrahydroindane, heptachloro-4, 7, methano-tetrahydroindane and hexachlorocyclohexane; and organo-phosphorous compounds selected from the class consisting of 0,0-dimethyl phosphorothioate of diethyl mercaptosuccinate, and 0,0-diethyl-3,5,6-trichloro-2-pyridyl phosphorothioate, having low solubility in natural waters in a vulcanized matrix of 100 parts by weight of vulcanizable organic elastomer selected from the class consisting of natural rubber, neoprene, nitrile rubber, butyl rubber, styrene/butadiene rubber, and polybutadiene, plus 5 to 100 parts by weight of carbon black per 100 parts of said elastomer the proportion of said carbon black in the range given being selected to yield a desired rate of release of said toxicant by said composition to the environment wherein the maximum number of parts of said toxicant employed is the number equal to the limit of the parts of said toxicant soluble in the said 100 parts of elastomer, the improvement whereby from about 1 to about 90 parts by weight of said toxicant material in addition to the said number of parts of said toxicant is combined in said composition, said improvement comprising the addition to said elastomer plus carbon black of a mixture of said 1 to 90 parts of said toxicant material in physical combination with microballoons said microballoons being characterized as minute spheres 10–60 microns in diameter, with wall thicknesses ranging from 0.5 to about 3 microns and bulk density of about 0.100 to 0.150 g/cc.

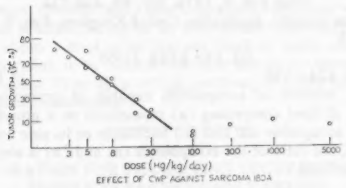
3,928,565
PHARMACEUTICAL PREPARATION OF PSEUDOMONAS AERUGINOSA BACTERIAL COMPONENT POSSESSING ANTI-TUMOR AND ANTI-INFECTION PROPERTIES

Yuzuru Homma; Chiyoji Abe, both of Tokyo, and Hiroshi Shionoya, Niiza, all of Japan, assignors to Yuzuru Homma; Chiyoji Abe and Hiroshi Shionoya, all of, Japan

Division of Ser. No. 190,536, Oct. 19, 1971. This application Dec. 4, 1972, Ser. No. 312,212

Int. Cl. A61k *23/00*

U.S. Cl. 424—92 **2 Claims**



EFFECT OF CWP AGAINST SARCOMA 180A

1. A method for the treatment of infections caused by *Pseudomonas aeruginosa* which comprises parenterally administering to a human 1 – 100 μg/day of a cell wall protein component produced by aerobic cultivation in an aqueous medium of *Pseudomonas aeruginosa* and having the following properties:

ultraviolet absorption peaks at 275–280 nm, 410–415 nm, and 550 nm (weak);

analysis — 10–16% nitrogen, less than 5% sugars in terms of glucose, 0.03 to 1.7% amino sugars and 0.3 to 2.0% phosphorus;

isoelectric point at about pH 4.5,

sparingly soluble in water and aqueous mineral acids, readily soluble in aqueous alkali.

3,928,566
LYOPHILIZED BIOLOGICAL PRODUCTS

Anglis R. Briggs, Newark, Del., and Thomas J. Maxwell, Philadelphia, Pa., assignors to E. I. du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. Nos. 177,834, Sept. 3, 1971, abandoned, and Ser. No. 63,942, Aug. 14, 1970, Pat. No. 3,721,725. This application Mar. 12, 1973, Ser. No. 340,196

Int. Cl.² A61K *37/48, 35/14, 35/40*

U.S. Cl. 424—94 **8 Claims**

1. A lyophilized product containing at least one biologically active component said product comprising a plurality of uniform sized porous spheres, said product being formed according to a process comprising the steps of:

a. forming a solution or colloidal suspension of a substance containing at least one biologically active material in a liquid which will freeze and which will also vaporize at a temperature which will not destroy the biological activity of said material;

b. spraying said solution or colloidal suspension onto the surface of a moving bath of boiling fluorocarbon refrigerant having a boiling temperature of below about −20°C. from a sufficient height above the surface of the moving bath to allow droplet formation before the solution strikes the surface of the moving bath, whereby said droplets are frozen; and

c. lyophilizing said droplets to form a plurality of uniformed sized porous spheres in which the volume of the sphere that is not occupied by pores contains a uniform distribution of said substance containing at least one biologically active material.

3,928,567
DIETARY SUPPLEMENT

Ariel A. Andersen, 1074 Ash Ave., Provo, Utah 84601, and Wayne B. Binns, 555 N. 300 East, Logan, Utah 84321

Filed Aug. 26, 1974, Ser. No. 500,304

Int. Cl.² A61K *33/14, 37/48*

U.S. Cl. 424—94 **6 Claims**

1. A food dietary supplement composition consisting of Brewer's yeast and Potassium Chloride with said yeast being in the range of between 3 and 5 grams per day by weight and said Potassium Chloride being in the ranges of 0.3 to 1.0 gram by weight.

3,928,568
AMPLIFYING FACTOR OF CORTISONE INDUCTION AND PROCESS OF THE PRODUCTION THEREOF

Nobuhiko Katunuma, Tokushima, Japan, assignor to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 180,756, Sept. 15, 1971, abandoned. This application Sept. 24, 1973, Ser. No. 399,795

Claims priority, application Japan, Sept. 19, 1970, 45-81821

Int. Cl. A61k *21/00*

U.S. Cl. 424—115 **8 Claims**

1. A process for the production of an amplifying factor of cortisone induction comprising the steps of:

cultivating a microorganism selected from the group consisting of *Escherichia coli* IAM 1016, *Escherichia coli* IAM 1253, *Erwinia aroideae* IAM 1068, *Edwinia carotovora* IAM 1024, *Serrati marcesens* ATC 21717, *Proteus mirabilis* ATCC 21718, *Proteus vulgaris* ATCC 21719, *Proteus morganii* ATCC 21720, and *Aerobacter aerogenes* IAM 1183 under normal growth conditions in an aqueous nutrient medium containing assimilatable sources of carbon, nitrogen and inorganic salts until a sufficient amount of an amplifying factor of cortison induction is obtained; extracting the cells from said broth with water or physiological saline solution to obtain an aqueous bacterial extract;

deproteinizing said extract;
absorbing said deproteinized extract on activated carbon at a pH of 3–7;
eluting the adsorbate with 50:50 alkali-acetone mixture to obtain an eluate;
neutralizing and concentrating the eluate;
subjecting the concentrate to column chromatography on dextran gel having a fractionation range of less than 700; and
collecting the fractions containing an amplifying factor of cortison induction.

3,928,569

TWO SUBSTANCES INHIBITING BETA-LACTAMASE AND THEIR PRODUCTION

Hamao Umezawa, Tokyo; Susumu Mitsuhashi, Musashino; Ryozo Utahara, Tokyo, and Tetsuo Ishikawa, Yokohama, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaki Kenkyu Kai, Tokyo, Japan

Filed Aug. 2, 1973, Ser. No. 385,057
Claims priority, application Japan, Aug. 9, 1972, 47-79086; May 21, 1973, 48-55721
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—117 **6 Claims**

1. Bacteriostatis MC696-SY2-A substance obtainable by the aerobic cultivation of *Streptomyces fulvoviridis* ATCC 21,954, said substance being heat labile and of an acidic nature; inhibiting β-lactamase activity; being soluble in water but substantially insoluble in butanol, ethyl acetate, ethyl ether, chloroform and benzene; being hydrolyzable by heating with concentrated HCl in a sealed tube for 16 hours at about 100°C. to NH_3, aspartic acid, glutamic acid, glycine and tyrosine; and being resistant to penicillinase at 37° C. for 3 hours under conditions which completely hydrolyze benzylpencillin; said MC696-SY2-A substance being further characterized by
a. having an infrared absorption spectrum pelleted in potassium bromide corresponding to that shown in FIG. 1 of the attached drawings;
b. the elemental analysis of an impure sample having a potency of 60,400 units/mg. being C 41.46%; H 4.83%; N 6.58%; O 29.16%; S 2.07%; and sodium-containing ash 27%;
c. having an ultraviolet absorption spectrum characterized by λ_{max} at about 270–272 nm ($E_{1\ cm}^{1\%}$ 115); and
d. giving a R_f value in thin layer chromatography on silica gel GF_{254} on 5 × 20 cm. glass plates of about 0.32–0.37 with n-propanol-0.1 M (pH 7) phosphate buffer (7:3) as the developing solvent.

3,928,570

AMPHOTERICIN COMPLEXES

Julio Metzger, East Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 203,037, Nov. 29, 1971, abandoned. This application Dec. 28, 1973, Ser. No. 429,226
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—118 **1 Claim**

1. A complex comprising amphotericin B and calcium ion in a ratio of about 1 mole of amphotericin B to about 0.25 mole of calcium ion, the complex being crystalline and substantially free of chlorine, and having a solubility in water of over 2 grams per liter at about pH 2, having an infra-red spectrum showing peaks at about 3.0, 3.45, 5.87, 6.4, 7.2, 8.5, 8.88, 9.07, 9.38, 9.65, 9.93, 11.35 and 11.80 microns, and having the following elemental analysis: C, 52.55%; H, 7.25%; N, 1.64%; O, 37.64%; and Ca, 0.92%.

3,928,571

RUMINANT FEED UTILIZATION IMPROVEMENT

Arthur P. Raun, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 315,721, Dec. 15, 1972, Pat. No. 3,816,618. This application Feb. 14, 1974, Ser. No. 442,541
Int. Cl.[2] A61K *35/70*
U.S. Cl. 424—118 **7 Claims**

1. A method of increasing the efficiency of feed utilization by ruminant animals having a developed rumen function which comprises the oral administration to such animals of a propionate-increasing amount of an antibiotic chosen from the group consisting of A477, A-4696, and their physiologically-acceptable esters and salts.

3,928,572

MYRIOCIN AND PROCESS OF PREPARATION

Dieter Kluepfel, Montreal; Alicia Kudelski, Westmount, and Jehan Bagli, Kirkland, all of Canada, assignors to Ayerst Mckenna and Harrison Ltd., Montreal, Canada

Filed Feb. 11, 1971, Ser. No. 114,445
Int. Cl.[2] A61K *35/00*
U.S. Cl. 424—122 **4 Claims**

1. Myriocin, a compound which
a. is effective in inhibiting the growth of pathogenic fungi;
b. is soluble in methanol, somewhat less soluble in ethanol, slightly soluble in t-amyl alcohol, and substantially insoluble in water, ether, chloroform, and ethyl acetate;
c. has the following elemental analysis: C, 62.99: H, 9.72; N, 3.37 percent;
d. has an empirical formula $C_{21}H_{39}O_6N$;
e. has an optical rotation $[\alpha]_D^{25} + 10.3°$ (c = 0.386 percent, methanol);
f. does not show any characteristic absorption in the ultraviolet region from 220–400 mμ;
g. has a characteristic infrared absorption spectrum as shown in FIG. 1 of the accompanying drawing;
h. has a melting point of 183° to 184°C; and
i. shows a minimum inhibitory concentration against Candida albicans of 4 mcg/ml.

3,928,573

COMPOSITIONS OF MATTER

Theodoor Van Eek, Amerongen, and Robert Beukers, Nootdorp, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Feb. 8, 1974, Ser. No. 440,724
Claims priority, application United Kingdom, Feb. 9, 1973, 6484/73
Int. Cl.[2] A61K *27/00*
U.S. Cl. 424—122 **11 Claims**

1. A mixture of compounds capable of promoting the growth of fowl comprising (a) mocimycin or a growth-promoting acceptable salt and (b) bacitracin or its zinc complex thereof, the ratio of the compounds (a) and (b) is about 1:4 to about 1:10.

3,928,574

METHOD AND COMPOSITION FOR TREATING DIARRHEA IN MAMMALS

Robert W. Phillips, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

Filed Mar. 27, 1973, Ser. No. 345,274
Int. Cl.[2] A61K *33/14. 33/10, 31/70*
U.S. Cl. 424—153 **17 Claims**

1. A parenteral composition for use as supportive therapy in a treatment for diarrhea in bovine animals that includes the replacement of lost sodium and chloride ions comprising: a buffered basic aqueous solution that is either isotonic or hypertonic with respect to normal blood, between approximately three and twelve times the potassium ion concentration present in normal blood, said blood normally having a potassium

ion concentration of about 5 meq./L., and an amount of glucose effective as a source of energy and effective to enhance the movement of potassium into the cells thereby replacing lost potassium.

3,928,575

METHOD AND COMPOSITION FOR RAPID DISINFECTION

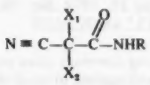
Clarence L. Moyle, Clare, and Paul A. Wolf, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 118,520, Feb. 24, 1971, abandoned. This application Jan. 30, 1974, Ser. No. 438,074

Int. Cl.² A61K *33/14*; **A01N** *9/02*

U.S. Cl. 424—153 **12 Claims**

1. A method of enhancing the antibacterial efficacy of a halocyanoacetamide in an aqueous environment, said halocyanoacetamide corresponding to the formula



wherein X_1 represents chlorine or bromine; X_2 represents chlorine, bromine or hydrogen and R represents hydrogen or methyl which comprises adding thereto a source of halide ion selected from the group consisting of water-soluble alkali metal bromides, alkali metal iodides, alkaline earth metal bromides, alkaline earth metal iodides, ammonium bromide and ammonium iodide in an amount of from about 0.05 mole of said halide ion per mole of halocyanoacetamide up to about 99.999 percent by weight of halide ion.

3,928,576

METHOD OF PREVENTION AND TREATMENT FOR THE KETOSIS AND OSTEOMALACIA OF CATTLE

Shigeru Yoshida, 464 Kami Iwanari, Miyuki-cho, Fukuyama, Hiroshima, Japan

Filed June 5, 1973, Ser. No. 367,162

Claims priority, application Japan, June 6, 1972, 47-55579

Int. Cl.² A61K *33/06*, *33/14*

U.S. Cl. 424—154 **3 Claims**

1. A method for the prevention and treatment of ketosis and osteomalacia of cattle which consists in the administration to cattle by venous injection or oral administration of magnesium salt selected from the group consisting of magnesium sulfate, magnesium chloride and basic magnesium carbonate wherein said salt is administered in an amount corresponding to between about 1 to 4 g. of Mg per head of cattle when the administration is by venous injection and in an amount between about 10 to 20 g. of Mg per head of cattle when the administration is orally.

3,928,577

PREPARATION FOR PRESERVING VEGETABLE FOOD PRODUCTS PARTICULARLY FRUITS

Alexandra Ivanovna Kochurova, Universitetsky prospekt, 23, korp. 2, kv. 72, Moscow; Zoya Vasilievna Korobkina, Gospitalnaya ul., 16, Hodpiyslnsys ul., 16, and Tatiana Nikolaevna Mikhallova, Velozavodskaya ul., 3/2, kv. 30, Moscow, all of U.S.S.R.

Continuation of Ser. No. 26,422, April 7, 1970, abandoned, which is a continuation of Ser. No. 619,208, Feb. 28, 1967, abandoned. This application June 22, 1971, Ser. No. 155,633

Int. Cl.² A01N *13/00*

U.S. Cl. 424—164 **12 Claims**

1. A preparation in the form of tablets for preserving vegetable products comprising 90 to 97 weight percent of potassium metabisulfite, 1 to 4 weight percent of a component selected from the group consisting of starch and gelatin, 1 to 3 weight percent of a component selected from the group consisting of magnesium stearate and calcium stearate, and 1 to 3 weight percent of stearic acid.

3,928,578

COMPOSITION FOR CONTROL OF WHITE MUSCLE DISEASE

Henry C. Burns, and George C. McConnell, both of Piedmont, Calif., assignors to Chromalloy Pharmaceutical, Inc., Wilmington, Del.

Continuation of Ser. No. 639,923, April 28, 1967, Pat. No. 3,829,566, which is a continuation-in-part of Ser. No. 352,681, March 17, 1964, abandoned, which is a continuation-in-part of Ser. Nos. 300,684, Aug. 7, 1963, abandoned, and Ser. No. 96,733, March 20, 1961, abandoned. This application Dec. 5, 1973, Ser. No. 421,841

Int. Cl.² A61K *31/335*, *33/04*

U.S. Cl. 424—164 **9 Claims**

1. A product useful in controlling white muscle disease syndrome in mammals, said product consisting essentially of a synergistic mixture of vitamin E and sodium selenite, the weight ratio of vitamin E to selenium being in the range 50:1 to 200:1, said mixture being in a pharmaceutically acceptable carrier in a medically effective amount and said product having a maximum selenium content of about 1.2% by weight.

3,928,579

PROCESS FOR THE PURIFICATION OF COAL TAR

James Edward McShane, San Antonio, Tex., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 25, 1974, Ser. No. 526,649

Int. Cl.² A61K *31/00*; **A61L** *13/00*

U.S. Cl. 424—167 **1 Claim**

1. A process for the purification of coal tar which comprises mixing coal tar with a non-polar volatile solvent system having a kauri-butanol value of less than 75 and a boiling point no higher than 80°C. comprising a fluorocarbon of the group consisting of trichlorofluoromethane, dichlorodifluoromethane, 1,2-dichloro-1,1,2,2-tetrafluoroethane, 1,1,2-trichloro-1,2,2-trifluoroethane and difluorochloromethane, and mixtures thereof with n-butane, isobutane, propane, pentane and n-hexane, separating the supernatant liquid and evaporating the solvent to recover the desired coal tar fraction.

3,928,580

INJECTABLE GLYCOPROTEINS CONTAINING TERMINAL "C" ENDS OF HUMAN IMMUNOGLOBULINS

Michel J. Fontaine, 448, rue Paradis, 13008 Marseilles, France

Filed Mar. 19, 1974, Ser. No. 453,019

Claims priority, application France, Mar. 22, 1973, 73.11455

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **12 Claims**

1. A pharmaceutical composition having anti-allergic, anti-inflammatory, and immunodepressant activity comprising a sterile injectable solution of from 1 mg/ml to 20 mg/ml of glycoproteins consisting essentially of the terminal C ends of the heavy chains of human immunoglobulins D.

3,928,581
CERTAIN POLYMER-IRON COMPLEXES FOR TREATMENT OF IRON DEFICIENCY

Alf-Goran Dahlberg, Nykvarn; Karl Gustav Hogberg, Sodertalje; Sven Lindvall, Sodertalje, and Thore Oskar Verner Rydh, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Mar. 22, 1973, Ser. No. 343,690

Claims priority, application South Africa, Sept. 13, 1972, 72/6255

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 **19 Claims**

1. A composition for treatment of iron deficiency by parenteral administration comprising an aqueous solution of a complex of ferric iron, said complex containing ferric iron which is bound to a polymer wherein said complex is prepared by

A. reacting in an aqueous solution at a temperature between about 20°C and the boiling point of the reaction mixture

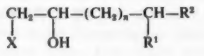
1. about 0.1 to 1.0 moles of a saccharide (per mole of component (3) below) which is selected from the group consisting of

a. sucrose,

b. trehalose, and

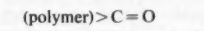
c. raffinose;

2. about 0.05 to 5 moles of a polymerization agent (per mole of component (3) below) of the formula



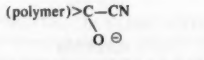
wherein *n* is an integer selected from the group consisting of 0, 1, 2, 3 and 4; X is selected from the group consisting of Cl, Br, and I; R^1 is selected from the group consisting of OH, Cl, Br, and I; and R^2 is selected from the group consisting of H and CH_2X with the proviso that R^2 is CH_2X only when R^1 is OH, wherein X has the meaning specified above; the epoxides or the diepoxides derivable therefrom; and

3. a hexitol selected from the group consisting of sorbitol, hydroxypropyl sorbitol, mannitol, talitol, iditol, galactitol, and allitol to form a first intermediate of the formula



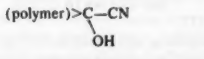
I;

B. reacting said first intermediate product with a cyanide selected from the group consisting of KCN, NaCN, $Ca(CN)_2$, HCN, and NH_4CN in an amount at least equimolar with the amount of carbonyl groups on the first intermediate product to form a second intermediate product of the formula



II;

C. acidifying said second intermediate product to form a third intermediate product of the formula



III;

D. hydrolyzing said third intermediate product to form a water swellable polymer of the formula

IV;

and

E. reacting said water swellable polymer with a ferric compound in solution under alkaline conditions to form said complex of ferric iron.

3,928,582
N¹-OXIDES OF ADENOSINE-5′-CARBOXYLATES FOR TREATING ANGINA

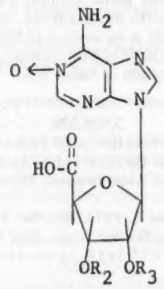
Raj Nandan Prasad, Pierrefonds, Canada, assignor to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 294,741, Oct. 3, 1972, Pat. No. 3,830,783. This application May 21, 1974, Ser. No. 472,030

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 **3 Claims**

1. A method of increasing coronary sinus partial pressure of oxygen in an angina pectoris patient in need of such treatment comprising administering to said patient a dosage of from 0.025 to 30 mg./kg. of body weight daily of a compound of the formula



wherein R_1 is loweralkyl, lowerhydroxyalkyl or lowerhaloalkyl, and R_2 and R_3 each are hydrogen, acetyl, propionyl, or butyryl, or when taken together form an isopropylidene or benzylidene moiety; or a pharmaceutically acceptable acid addition salt thereof.

3,928,583
METHOD FOR REDUCING SIDE EFFECTS OF AMINOGLYCOSIDE ANTIBIOTICS

Kouji Furuno; Hideki Nakano; Syuzo Matsubara, and Akitoshi Shioya, all of Tokyo, Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1974, Ser. No. 495,498

Claims priority, application Japan, Aug. 31, 1973, 48-97344

Int. Cl.² A01N *9/00, 9/28*

U.S. Cl. 424—180 **9 Claims**

1. A method of reducing the renal toxicity and 8th nerve toxicity to mammals or poultry of aminoglycoside antibiotic comprising administering said aminoglycoside antibiotic in combination with the oral administration of 2,5-di-O-acetyl-D-glucosaccharo-1,4: 6,3-dilactone to said mammals or poultry for treating bacterial infection in an amount of 50–1000% by weight based on the free form of said antibiotic.

3,928,584

EXTRACTS FROM ACTIVE TREE SAPS FOR TREATING P388 MOUSE LEUKEMIA

Monie S. Hudson, San Jose, Costa Rica, assignor to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Continuation-in-part of Ser. No. 837,861, June 30, 1969, abandoned. This application Apr. 5, 1972, Ser. No. 241,409

Int. Cl.² A61K *35/78*

U.S. Cl. 424—195 8 Claims

1. A method of treating P388 leukemia in mice which consists in injecting in said mouse an effective amount for treating P388 mouse leukemia of a tree sap which has been extracted with water and subsequently dried and which tree is selected from the group consisting of:

Quercus stellata,
Halesia carolina var. monticola and
Salix longipes.

3,928,585

TREATMENT OF HYPOAZOTEMIC AND ATHEROMATOUS CONDITIONS USING LESPECAPITOSIDE AND PROCESS FOR OBTAINING SAME

Claude Marie Henri Cerveile, 165 Boulevard Haussmann, Paris, France

Filed Apr. 28, 1967, Ser. No. 634,488

Claims priority, application France, May 5, 1966, 66.60476; July 28, 1966, 66.71310The portion of the term of this patent subsequent to Dec. 27, 1983, has been disclaimed.

Int. Cl.² A61K *35/78*

U.S. Cl. 424—195 9 Claims

1. A process for the production of lespecapitoside which comprises:

i. drying leaves of *Lespedeza capitata* harvested in the months of June, July, or August;
ii. powdering said leaves;
iii. extracting the powder obtained in (ii) twice with methanol;
iv. evaporating the solution obtained in (iii) to dryness in vacuo;
v. taking up the residue in (iv) in boiling water;
vi. extracting the aqueous solution obtained in (v) with ethyl acetate;
vii. evaporating in vacuo the solution in ethyl acetate obtained in (vi);
viii. taking up the residue obtained in (vii) in boiling 30° alcohol;
ix. and cooling the alcoholic solution obtained in (viii) to obtain crystals.

3,928,586

O,O-DIETHYL-0-1-(2,4-DICHLOROPHENYL)-2,2-DIBROMOVINYL PHOSPHATE USED TO CONTROL THE COLORADO POTATO BEETLE

Bohdan Śledzinski; Józef Kroczyński, both of Warsaw; Andrzej Zwierzak, Lodz; Ludwika Cieślak, and Aleksander Majda, both of Warsaw, all of Poland, assignors to Instytat Przemyslu Organicznego, Warsaw, Poland

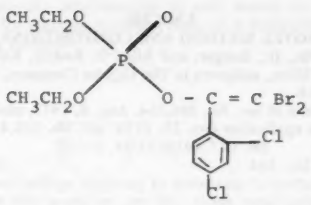
Filed July 27, 1973, Ser. No. 383,459

Claims priority, application Poland, Aug. 1, 1972, 157044; Nov. 21, 1972, 158980

Int. Cl.² A01N *9/36*

U.S. Cl. 424—219 1 Claim

1. A method of killing Colorado potato beetles, comprising contacting them with an insecticidal amount of a compound having the formula



3,928,587

METHOD OF CONDITIONING VASCULAR SYSTEMS BY ADMINISTERING 3,5 DICHLOROASPIRIN AND METHOD OF EVALUATING PHARMACEUTICAL COMPOUNDS

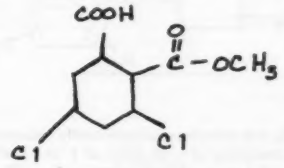
Philip Nicholas Sawyer, 606 Third St., Brooklyn, N.Y. 11215

Filed Aug. 16, 1974, Ser. No. 497,851

Int. Cl.² A61K *31/60*

U.S. Cl. 424—230 4 Claims

1. A method for rendering more negative the internal surface of a vascular system in order to decrease thrombotic tendency, said method comprising administering 3,5 dichloroaspirin in the order of magnitude of about 5–15 mg./kg. of body weight daily to a host requiring such treatment, the 3,5 dichloroaspirin having the structure



3,928,588

METHOD OF REDUCING THE UNDESIRABLE GASTROINTESTINAL EFFECTS OF PROSTAGLANDIN SYNTHETASE INHIBITORS

André Robert, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 22, 1974, Ser. No. 446,197

Int. Cl.² A61K *31/61*

U.S. Cl. 424—234 8 Claims

1. A method of reducing undesirable gastrointestinal effects caused by an anti-inflammatory prostaglandin synthetase inhibitor in a human suffering therefrom, which comprises the concomitant systemic administration with the anti-inflammatory prostaglandin synthetase inhibitor of a prostaglandin of the PGFβ -type, or an alkyl ester containing from one to 4 carbon atoms, inclusive, or a pharmaceutically acceptable salt thereof in an amount effective to reduce the undesirable gastrointestinal effects of the anti-inflammatory prostaglandin synthetase inhibitor.

3,928,589
NOVEL METHOD AND COMPOSITIONS

Walter Friis, Jr., Bangor, and Allan D. Rudzik, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 386,564, Aug. 8, 1973, abandoned. This application Oct. 29, 1974, Ser. No. 518,451
Int. Cl.² A61K *31/33, 31/195*
U.S. Cl. 424—244 2 Claims

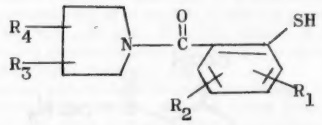
1. A method of treatment of paralysis agitans comprising administering from about 250 mg. to about 500 mg. of a compound selected from the group consisting of 3,4-dihydroxyphenyl-1-alanine, a hydrate thereof, or a pharmaceutically acceptable acid addition salt thereof and the co-administering of a potentiating dose of 7-chloro-1,3-dihydro-1-methyl-5-phenyl-2H-1,4-benzodiazepine-2-one in an amount of from about 1 mg. to about 5 mg. to a human afflicted with paralysis agitans.

3,928,590
ORTHO-MERCAPTOAROYLAMIDES AND SALTS THEREOF AS HYPOGLYCEMIC AGENTS

Milton Wolf, West Chester; John H. Sellstedt, Pottstown, and Richard L. Fenichel, Wyncote, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 232,250, March 6, 1972, Pat. No. 3,853,876. This application June 6, 1974, Ser. No. 477,121
Int. Cl.² A61K *27/00*
U.S. Cl. 424—245 10 Claims

1. A method for reducing the blood sugar level in a hyperglycemic, warm-blooded animal which comprises administering, orally or intramuscularly, in an amount sufficient to reduce said blood sugar level, a compound of the formula



in which:

R_1 and R_2 are members independently selected from the group consisting of —H, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, —F, —Cl, —Br, —I, dialkylamino in which each alkyl group has from 1 to 6 carbon atoms, —OH, —SH, $—NO_2$ and alkylthio having from 1 to 6 carbon atoms;

R_3 and R_4 are members independently selected from the group consisting of —H, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, —F, —Cl, —Br, —I and dialkylamino in which each alkyl group has from 1 to 6 carbon atoms;

or a pharmaceutically acceptable salt thereof.

3,928,591
7-(D-α-AMINO-1,4-CYCLOHEXADIEN-1-YLACETAMIDO)DESACETOXYCEPHALOSPORANIC ACID DIHYDRATE COMPOSITIONS

Friedrich Dürsch, Hopewell, and Theodore Michael Siewarga, Parlin, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 258,767, June 1, 1972, Pat. No. 3,819,620. This application Jan. 23, 1974, Ser. No. 435,913
Int. Cl.² A61K *31/51*
U.S. Cl. 424—246 4 Claims

3. A method for treating microbial infections in mammals which comprises administering orally or by injection an antimicrobially effective amount of said composition of claim 1.

3,928,592
ANTIBIOTIC PHARMACEUTICAL COMPOSITIONS

James M. Greene, Indianapolis, and Joseph M. Indelicato, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 21, 1974, Ser. No. 444,622
Int. Cl.² A61K *31/54*
U.S. Cl. 424—246 2 Claims

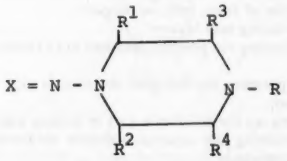
1. An antibiotic pharmaceutical composition in dosage unit form comprising a therapeutically effective amount of between about 50 mg. and 1000 mg. per dosage unit of sodium 7-(D-2-formyloxy-2-phenylacetamido)-3-(1-methyl-1H-tetrazole-5-ylthiomethyl)-3-cephem-4-carboxylate in admixture with between about 5 and 6 percent by weight of sodium carbonate or potassium carbonate.

3,928,593
ANTIVIRAL COMPOSITIONS CONTAINING PIPERAZINE DERIVATIVES AND METHOD OF USE

Giancarlo Lancini, Pavia, Italy, and Lise Thiry, Brussels, Belgium, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Apr. 22, 1971, Ser. No. 136,558
Claims priority, application Italy, June 1, 1970, 25380/70
Int. Cl.² A61K *31/495*
U.S. Cl. 424—250 7 Claims

1. A method for inhibiting the replication of an animal virus selected from the group consisting of vaccinia and herpes simplex viruses which comprises administering to an animal host having cells susceptible to invasion by said virus an antiviral effective amount of a compound corresponding to the formula



wherein R represents hydrogen, lower alkyl, 2 to 4 carbon alkanoyl or phenyl-lower-alkyl; R^1, R^2, R^3 and R^4 each represents hydrogen or lower alkyl; X is selected from the group consisting of H_2, benzylidene, and (H, 2 to 4 carbon alkanoyl); and a pharmaceutically acceptable acid addition salt thereof.

3,928,594
METHOD OF ALLEVIATING SYMPTOMS OF MULTIPLE SCLEROISIS

Albert W. Cook, Centre Island Road, Centre Island, Oyster Bay, N.Y. 11771

Filed June 24, 1974, Ser. No. 482,061
Int. Cl.² A61K *31/44*
U.S. Cl. 424—263 2 Claims

1. Method of alleviating one or more of the symptoms of multiple sclerosis comprising administering to a person suffering therefrom a dose of 2-formyl-1-methylpyridium oxime or a physiologically acceptable salt thereof effective to alleviate said symptoms of multiple sclerosis.

3,928,595
DIPENICILLIN AND DICEPHALOSPORIN ESTER ANTIBIOTICS

Sven Erik Dahlén; Bertil Ake Ekström, and Berndt Olof Harald Sjöberg, all of Sodertalje, Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Feb. 27, 1973, Ser. No. 336,194

Claims priority, application United Kingdom, Mar. 13, 1972, 11688/72

Int. Cl.² A61K *31/43*

U.S. Cl. 424—271 **2 Claims**

1. A method for the treatment of infection caused by bacterial organisms comprising administering to a man or an animal suffering from said bacterial infection an anti-bacterially effective amount of di[6-(D-α-aminophenylacetamido)-penicillanyl-methyl]-carbonate or a pharmaceutically acceptable salt thereof.

3,928,596
PHARMACEUTICAL COMPOSITIONS OF 5,6-DIALKOXY-2-AMINOBENZIMIDAZOLES AND METHOD FOR TREATING HYPERTENSION

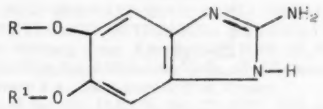
Louis L. Skaletzky, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 361,277, May 17, 1973, abandoned. This application May 28, 1974, Ser. No. 473,683

Int. Cl.² A61K *31/415*

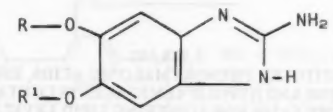
U.S. Cl. 424—273 **5 Claims**

1. A pharmaceutical dosage unit form adapted to systemic administration to obtain antihypertensive effects consisting essentially of an effective amount for said effects of a compound of the formula:



or a pharmaceutically acceptable acid addition salt thereof, wherein R and R^1 are each lower alkyl; in combination with pharmaceutical means selected from the group consisting of carriers, vehicles, diluents, excipients, preservatives, and isotonic agents which adapt the compound for systemic administration.

3. A method of obtaining antihypertensive effects in a mammal which consists essentially of administering systemically to said mammal a pharmaceutical dosage unit form supplying an effective amount for antihypertensive effect of a compound of formula:



or a pharmaceutically acceptable acid addition salt thereof wherein R and R^1 are each lower alkyl.

3,928,597
HYPERGLYCEMIA THERAPY

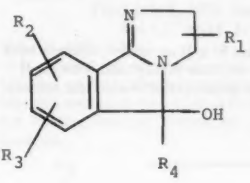
Harry Rosen, Drexel Hill, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 15, 1974, Ser. No. 497,806

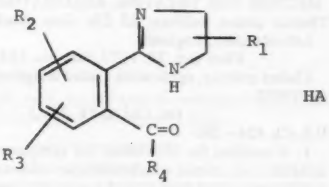
Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 **1 Claim**

1. The method of treating hyperglycemia in a warm-blooded animal suffering from hyperglycemia which comprises orally or parenterally administering to said animal an effective amount for treating hyperglycemia of a compound of the following formulae



and



HA

wherein:

R_1 is lower alkyl;

R_2 is hydrogen; R_3 is hydrogen; R_4 is selected from the group consisting of phenyl, monohalophenyl, and trifluoromethylphenyl; and HA is a pharmaceutically acceptable acid.

3,928,598
HEXAHYDRO-DIBENZO[b,d]PYRAN-9-ONES AS AN ANTI-ANXIETY DRUG

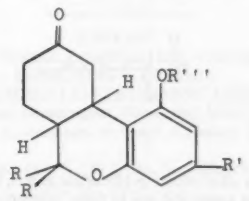
Robert A. Archer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 5, 1973, Ser. No. 413,009

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **11 Claims**

1. A process for treating mammals suffering for anxiety which comprises administering to a mammal in need of such treatment a dose of a compound represented by the formula



wherein R′ is either C_7–C_{10} normal alkyl or is the group

wherein R'' is C_2–C_7 alkyl and R^x is H or methyl, wherein both R groups are identical and are H or methyl and wherein R''' is H or C_1–C_4 alkanoyl, in an amount effective to treat anxiety.

3,928,599

METHOD FOR TREATING RHEUMATOID ARTHRITIS

Thomas James Sullivan, 25 Old Gate Road, Thrussington, Leicestershire, England

Filed Oct. 18, 1974, Ser. No. 515,919

Claims priority, application United Kingdom, Oct. 23, 1973, 49197/73

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **7 Claims**

1. A method for alleviating the symptoms of rheumatoid arthritis in an animal which comprises administering an effective quantity of 6,8-di-t-butyl-4-oxo-4H-1-benzopyran-2-carboxylic acid, or a pharmaceutically acceptable salt thereof, to an animal suffering from rheumatoid arthritis.

3,928,600

N-POLYHALOVINYLTHIOCARBOXAMIDES AS NEMATOCIDES

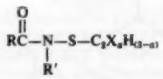
Melancthon S. Brown, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 253,642, May 15, 1972, Pat. No. 3,771,990, which is a division of Ser. No. 33,879, April 30, 1970, Pat. No. 3,679,673, which is a continuation-in-part of Ser. Nos. 810,368, March 25, 1969, abandoned, and Ser. No. 748,642, June 30, 1968, abandoned, each is a continuation-in-part of Ser. No. 704,555, Feb. 12, 1968, abandoned, said Ser. No. 810,386, is a continuation-in-part of Ser. No. 748,642,. This application Aug. 6, 1973, Ser. No. 386,269

Int. Cl.² A01N *7/04*

U.S. Cl. 424—298 **14 Claims**

1. A method for controlling nematodes which comprises contacting said nematodes with a nematocidally effective amount of an N-polyhalovinylthiocarboxamide of the formula



wherein R is alkyl of one to 10 carbon atoms, haloalkyl of one to 10 carbon atoms and one to three halogen atoms of atomic number 17 to 35 or cycloalkyl of three to 10 carbon atoms, R' is hydrogen or alkyl of one to four carbon atoms, X is halogen of atomic number 17 to 35 and *a* is 2 or 3.

3,928,601

PHENOXY-HYDROXYPROPYLAMINES, METHOD AND PHARMACEUTICAL PREPARATIONS FOR TREATING CARDIOVASCULAR DISEASES

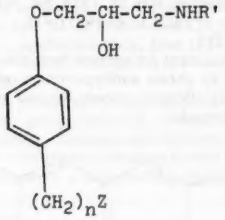
Arne Elof Brandstrom; Per Arvid Emil Carlsson, both of Goteborg; Stig Ake Ingemar Carlsson, Molnlycke; Hans Rudolf Corrodi, Sodertalje; Lars Ek, Onsala, and Bengt Arne-Hjalmar Ablad, Goteborg, all of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

Division of Ser. No. 342,749, March 19, 1973, Pat. No. 3,873,600, Continuation-in-part of Ser. No. 115,851, Feb. 16, 1971, abandoned. This application Jan. 15, 1974, Ser. No. 433,450

Int. Cl.² A61K *31/27*

U.S. Cl. 424—300 **18 Claims**

16. A method for treating cardiovascular diseases in animals including humans which comprises administering a therapeutically effective dose of a para-substituted phenoxyhydroxypropylamine compound selected from the group consisting essentially of a compound having the formula



and a pharmaceutically acceptable, non-toxic acid addition salt thereof, wherein R' is an isopropyl or tertiary-butyl radical; Z is —NHCOOR'', R'' being a straight or branched alkyl radical having 1 to 3 carbon atoms: and *n* is 1, 2 or 3, in association with a pharmaceutically acceptable carrier.

3,928,602

SUBSTITUTED PHENOXYMALONIC ACIDS, ESTERS THEREOF AND HYPOLIPAEMIC AGENTS CONTAINING THE SAME FOR LOWERING LIPID LEVELS

Dag Vilhelm Barthold, Solna; Johan Richard Dahlbom, Sodertalje; Harry Olof Magnusson, Bandhagen, and Berndt Olof Harald Sjöberg, Sodertalje, all of Sweden, assignors to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

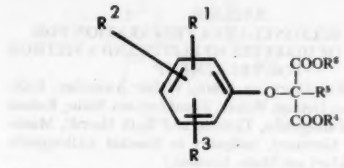
Filed Oct. 16, 1973, Ser. No. 406,920

Claims priority, application Sweden, Nov. 1, 1972, 14117/72

Int. Cl.² A61K *31/19, 31/235, 31/255*

U.S. Cl. 424—308 **26 Claims**

1. A method for lowering serum lipid concentration in animals, including man, which comprises administering to an animal in need of such treatment, as the active ingredient, a therapeutically effective amount of a compound of the formula



or a therapeutically acceptable salt thereof, wherein R^1 is selected from the group consisting of halogen, alkyl groups containing from 1 to 4 carbon atoms, alkoxy groups containing 1 to 4 carbon atoms, and trifluoromethyl; R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen, halogen, alkyl groups containing from 1 to 4 carbon atoms, alkoxy groups containing from 1 to 4 carbon atoms, and trifluoromethyl; R^4 and R^6 are the same or different and are selected from the group consisting of hydrogen and alkyl containing from 1 to 4 carbon atoms; and R^5 is an alkyl group containing from 1 to 4 carbon atoms, in association with a pharmaceutically acceptable carrier.

3,928,603
NEW DERIVATIVES OF ALPHA-METHYL BENZYLAMINE IN TREATING INFLAMMATION

Michele Moreau; Isaac Karadavidoff, both of Paris, and Claude Risse, Saint-Michel-sur-Orge, all of France, assignors to Fuveau S.A., Saint-Jean-de-livet, France

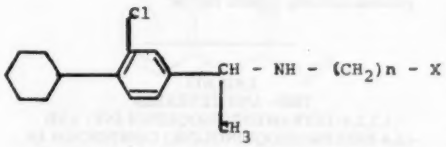
Division of Ser. No. 193,175, Oct. 27, 1971. This application May 13, 1974, Ser. No. 469,608

Claims priority, application France, Oct. 28, 1970, 70.38818; July 15, 1971, 71.25902

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **1 Claim**

1. A method of treating inflamed conditions, and in particular rheumatic disorders, in a patient comprising administering to the patient a dose of 100 to 1000 mg every 24 hours of a compound according to the formula:



in which X is hydrogen, halogen or an amine group of the formula

in which R_1 and R_2 are each hydrogen or a lower alkyl group, n is equal to 1, 2 or 3 and may equal 0 when X is hydrogen, or an addition salt thereof with a pharmaceutically acceptable acid.

3,928,604
ARYLACETYLENE COMPOUNDS AS ANTITHROMBOTIC AGENTS

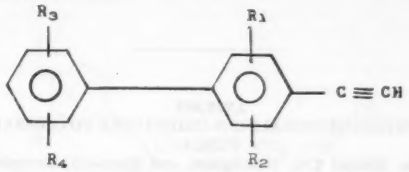
William B. Lacefield, and Winston S. Marshall, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 5, 1974, Ser. No. 485,877

Int. Cl.² A61K *31/03, 31/38*

U.S. Cl. 424—353 **9 Claims**

1. A method of treating vascular thrombosis in warm-blooded animals which comprises administering to a warm-blooded animal in need of such treatment an amount effective for treating vascular thrombosis of an arylacetylene of the formula,



wherein R_1, R_2, R_3, or R_4 is halo and the remainder of R_1, R_2, R_3 and R_4 independently are hydrogen or halo.

3,928,605
PHENYLANTIMONY BIS(2-PYRIDINETHIOL-1-OXIDE IN ANTIBACTERIAL AND ANTIFUNGAL COMPOSITIONS

John Downing Curry, Oxford, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 293,633, Sept. 29, 1972, Pat. No. 3,833,565. This application June 27, 1974, Ser. No. 483,596

Int. Cl.² A61K *31/44*

U.S. Cl. 424—245 **8 Claims**

7. The process of controlling bacteria, yeast, and fungal species, comprising the step of contacting said bacteria, yeast and fungal species with an effective amount of phenylantimony bis(2-pyridinethiol 1-oxide).

3,928,606
FUNGICIDAL COMPOSITION CONTAINING DIISOPROPYL 3-NITROPHTHALATE AND N-TRIDECYL-2,6-DIMETHYLMORPHOLINE

Ernst-Heinrich Pommer, Limburgerhof; Rudolf Polster, Frankenthal; Friedrich Loecher, and Manfred Hampel, both of Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 14, 1974, Ser. No. 523,666

Claims Priority, application Germany, Jan. 1, 1953, 2365177

Int. Cl.² A01N *9/20, 9/22*

U.S. Cl. 424—248 **1 Claim**

1. A fungicidal composition comprising a mixture of diisopropyl 3-nitroisophthalate and N-tridecyl-2,6-dimethylmorpholine in a ratio of from about 1:1 to about 4:1.

3,928,607
ANTIBACTERIAL COMPOSITION AND METHOD EMPLOYING A CERTAIN HEXAMETHYLENETETRAMINE ADDUCT

Jerome S. Luloff, Bloomington, Minn., and Albert L. Ellender, Flanders, N.J., assignors to Cosan Chemical Corporation, Clifton, N.J.

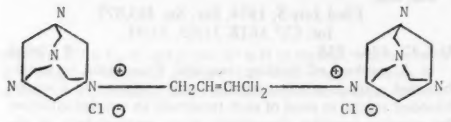
Filed Oct. 5, 1973, Ser. No. 403,819

Int. Cl.² A01N *9/22*

U.S. Cl. 424—249 **2 Claims**

1. An aqueous composition normally susceptible to deterioration by bacteria containing the two-to-one quaternary ammonium adduct of hexamethylenetetramine and 3,4-

dichlorobutene-1 in an amount effective to exert antibacterial activity, said adduct having the structural formula:



3,928,608
CERTAIN QUINOXALINE N-OXIDES USED TO COMBAT FUNGI

John Michael Cox, Wokingham, and Raymond Alexander Burrell, Yateley, both of England, assignors to Imperial Chemical Industries Limited, London, England

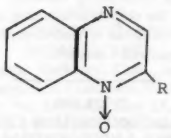
Filed Feb. 26, 1973, Ser. No. 336,045

Claims priority, application United Kingdom, Mar. 14, 1972, 11766/72; Oct. 23, 1972, 48631/72

Int. Cl.² A01N 9/22

U.S. Cl. 424—250 **2 Claims**

1. A method of combating fungi which comprises contacting said fungi or the loci thereof with a fungicidally effective amount of a quinoxaline derivative having the formula:



or a salt thereof wherein R is selected from the group consisting of SO_2X, SOX and SX where X contains from 1 to 7 carbon atoms and is selected from the group consisting of unsubstituted alkyl, alkenyl, alkynyl, aryl, alkaryl, and aralkyl; or alkyl containing 1–7 carbon atoms substituted with halogen, carboxy, ethoxy carbonyl or thiocyano.

3,928,609
NON-ALCOHOLIC THEOPHYLLINE PRODUCT

George D. Behrakis, Lowell, Mass., assignor to Dooner Laboratories, Inc., Haverhill, Mass.

Filed Apr. 5, 1973, Ser. No. 348,076

Int. Cl.² A61K 31/52

U.S. Cl. 424—253 **1 Claim**

1. A non-alcoholic composition for the treatment of bronchiospasm, cardiac asthma and as a diuretic consisting essentially of an effective amount of anhydrous theophyllin and a pharmaceutically acceptable vehicle consisting essentially of 20% propylene glycol and 10% glycerine and water.

3,928,610
BENZENE SULFONYL-UREA PREPARATION FOR TREATMENT OF DIABETES MELLITUS AND A METHOD FOR TREATMENT

Rudy Weyer, Frankfurt am Main; Walter Aumuller, Kelkheim, Taunus; Helmut Weber, Frankfurt am Main; Roland Schweitzer, Falkenstein, Taunus, and Ruth Heerdt, Mannheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

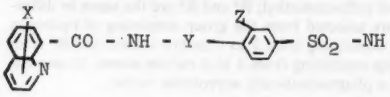
Division of Ser. No. 149,745, June 3, 1971, Pat. No. 3,751,418. This application Jan. 18, 1973, Ser. No. 324,834

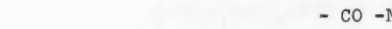
Claims priority, application Germany, June 6, 1970, 2627950

Int. Cl. A61k 27/00

U.S. Cl. 424—258 **3 Claims**

1. A pharmaceutical preparation for oral administeration and lowering the blood sugar level in the treatment of diabetes mellitus, which comprise about 0.5 to 100 mg per unit dose of a benzenesulfonylurea of the formula





in which:

X represents a hydrogen, chlorine or bromine atom, a methoxy or methyl group,

Y represents $-CH(CH_3)-CH_2-$, $-CH_2-CH(CH_3)-$ or $-CH_2-CH_2-$,

R is

a. alkyl having 3 to 6 carbon atoms

b. cycloalkyl having 5 to 8 ring carbon atoms, which is optionally substituted by 1 or 2 alkyl groups of up to 3 carbon atoms in total or by a chlorine atom,

c. cycloalkenyl having 5 to 8 ring carbon atoms, which is optionally substituted by 1 or 2 alkyl groups of up to 3 carbon atoms in total,

d. bicycloalkyl or bicycloalkenyl having 7 or 8 carbon atoms selected from the group consisting of endoalkylenecyclohexyl, endoalkylene-cyclohexenyl, bicyclo (2.2.1) hept-2ene-7-yl, 2,6-endomethylene cycloheptyhyl, 7-norcananyl or spiro (2,4)-heptyl,

e. nortricyclyl,

f. spiro[2,4]-heptyl,

Z is hydrogen or an alkylene radical having 1 or 2 carbon atoms, which forms with Y a 5- membered ring, and salts thereof of a pharmaceutically acceptable base and a pharmaceutically suitable carrier.

3,928,611
TRIS- AND TETRAKIS-(1,2,3,4-TETRAHYDROISOQUINOLINE) AND -[3,4-DIHYDROISOQUINOLINE] COMPOUNDS IN INHIBITING AND DISSOLVING BLOOD CLOTS

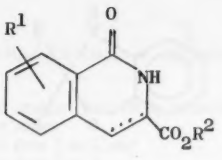
Parthasarathi Rajagapalan, Westbury, and Irwin J. Pachter, Fayetteville, both of N.Y., assignors to Endo Laboratories, Garden City, N.Y.

Continuation of Ser. No. 165,346, July 22, 1971, abandoned, which is a continuation-in-part of Ser. No. 1,029, Jan. 6, 1970, abandoned. This application Mar. 1, 1973, Ser. No. 336,973

Int. Cl.² A61K 31/47

U.S. Cl. 424—258 **13 Claims**

1. A method for inhibiting the formulation of, and for dissolving, blood clots in mammals, which comprises administering to said mammals an effective amount for inhibiting the formation of and for dissolving blood clots in mammals of a compound of the formula



wherein

A and B is each hydrogen;

R_1 and R_2 individually represent hydrogen or lower alkyl,

R_3, R_4 and R_5 represent hydrogen, lower alkyl, halogen, hydroxy, lower alkoxy, lower alkenoxy, lower alkynoxy, acetaxy or butyloxy phenoxyl, phenyl-lower alkoxy, or R_3 and R_4 or R_4 and R_5 may be linked to form methylenedioxy;

n represents 3; and

Z represents a straight or branched alkanetriyl chain, or a straight or branched alkanetriyl chain substituted by a nitro or amino group containing from 5 to 18 carbon atoms or a pharmaceutically acceptable acid addition salt thereof; and a pharmaceutically acceptable carrier therefor.

3,928,612

1,2-DIHYDRO- AND 1,2,3,4-TETRAHYDRO-1-OXO-3-ISOQUINOLINECARBOXYLIC ACID DERIVATIVES AS ANTI-ALLERGIC AGENTS

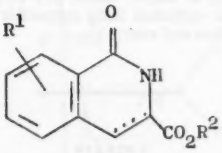
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, and Stanley C. Bell, Penn Valley, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 2, 1974, Ser. No. 511,341

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **7 Claims**

1. A method for preventing the physical manifestations of an atopic allergic reaction which comprises parenterally administering to a warm-blooded animal in need thereof, an effective amount of a compound of the formula:



in which

R^1 is —H, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxyalkoxy of 2 to 6 carbon atoms, halo, $—NO_2$, $—NH_2$, dialkylamino having from 1 to 6 carbon atoms in each alkyl group, $—COHN_2$, $—SO_2NH_2$, carbalkoxy having from 2 to 6 carbon atoms or alkylthio of 1 to 6 carbon atoms; and

R^2 is —H, alkyl of 1 to 6 carbon atoms, an alkali metal cation or the ammonium cation,

wherein the dotted line appearing in the structural formula represents optional unsaturation.

3,928,613

COMPOUNDS USEFUL AS ANTIDEPRESSIVE AGENTS

Peder Bernhard Berntsson, Frolunda; Per Arvid Emil Carlson, Goteborg, and Hans Rudolf Corrodi, Askim, all of Sweden, assignors to Aktiebolaget Hassle, Goteborg, Sweden

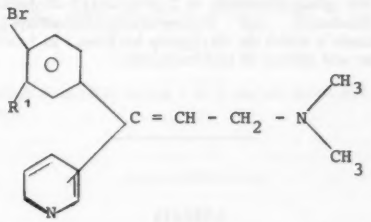
Division of Ser. No. 247,101, April 24, 1972, abandoned. This application Jan. 7, 1974, Ser. No. 431,123

Claims priority, application Sweden, Apr. 28, 1971, 5496/71

Int. Cl. A61k *31/44*

U.S. Cl. 424—263 **4 Claims**

1. A method for treating depression in man, characterized by the administration to a subject suffering from symptoms of central nervous system depression of a compound having the structural formula



where the pyridine nucleus is bound in the ortho-, meta- or para- position to the adjacent carbon atom and where R^1 is selected from the group consisting of H and Br, in an amount effective to mitigate said symptoms or a therapeutically acceptable acid addition salt thereof, together with a pharmaceutically acceptable carrier.

3,928,614

3-AROYL-ALKENYLENEIMINES IN TREATING INFLAMMATION

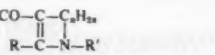
Harris Burt Renfroe, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 269,901, July 4, 1972, Pat. No. 3,835,149, which is a continuation-in-part of Ser. No. 203,479, Nov. 30, 1971, abandoned. This application Jan. 23, 1974, Ser. No. 435,810

Int. Cl.² A61K *31/33*, *31/38*, *31/40*, *31/44*

U.S. Cl. 424—263 **9 Claims**

1. An antiinflammatory pharmaceutical composition comprising an antiinflammatory effective amount of a compound corresponding to the formula



wherein Ar is unsubstituted phenyl, or phenyl substituted by up to two members selected from lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, halogeno, trifluoromethyl, amino or di-lower alkylamino, the alkylene group C_nH_{2n} separates the carbon from the nitrogen atom by 2-4 carbon atoms, n is an integer from 2 to 7, R is hydrogen or lower alkyl and R' is hydrogen, lower alkanoyl, lower alkoxycarbonyl, Ar-lower alkanoyl, Ar-carbonyl, carbamoyl, N-Ar-carbamoyl or -thiocarbamoyl, or therapeutically acceptable acid addition salts of the amino compounds, in conjunction or admixture with a pharmaceutical excipient.

3,928,615
METHOD OF PROTECTING SEEDS AND PLANTS AGAINST FUNGI

Ludwig Nusslein; Kurt Roder, and Ernst Albrecht Pieroh, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany

Continuation-in-part of Ser. No. 244,260, April 14, 1972, abandoned. This application Feb. 21, 1974, Ser. No. 444,410

Claims priority, application Germany, May 6, 1971, 2123023

Int. Cl.² A01N 9/00, 9/22

U.S. Cl. 424—263 **1 Claim**

1. The method for protecting crop plants against infestation by seed-borne and soil-borne phytopathogenic fungi which comprises contacting the seeds of said crop plants, prior to germination, with a fungicidal amount of a compound selected from the group consisting of 2-(4-pyridyl)-5-alkylsulfonyl-1,3,4-thiadiazole and 2-(4-pyridyl)-5-alkylsulfinyl-1,3,4-thiadiazole in which the alkyl group has from 1 to 5 carbons and the acid adducts of said thiadizoles.

3,928,616
DERIVATIVES OF CERTAIN N-OXYPYRIDYL GERANYL ETHERS USED IN CONTROLLING INSECTS

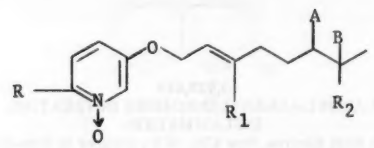
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 412,091, Nov. 2, 1973, Pat. No. 3,864,334. This application Oct. 24, 1974, Ser. No. 517,696

Int. Cl.² A01N 9/22

U.S. Cl. 424—263 **1 Claim**

1. A method of impeding the metamorphosis of tenebrio molitor comprising applying thereto in its larval stage a metamorphosis inhibiting amount of a compound of the formula:



in which R is hydrogen or alkyl having 1 to 4 carbon atoms; R^1 is methyl; R^2 is methyl; A and B together form a bond, or A is hydrogen and B is hydrogen.

3,928,617
CONTROL OF ACARIDS USING CERTAIN BENZOTHIAZOLES OR BENZOTHIAZOLINES

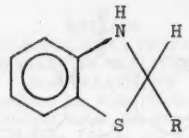
Winchester L. Hubbard, Woodbridge; Robert E. Grahame, Jr., Cheshire; Rupert A. Covey, Bethany, and Elmar H. Jancis, Naugatuck, all of Conn., assignors to Uniroyal Inc., New York, N.Y.

Division of Ser. No. 420,749, Nov. 30, 1973, Pat. No. 3,876,791. This application Jan. 24, 1975, Ser. No. 543,717

Int. Cl.² A01N 9/22

U.S. Cl. 424—270 **9 Claims**

1. A method of controlling acarids comprising applying, to a locus subject to attack by acarids, an acaricidal amount of a benzothiazoline of the formula



where R is phenyl, monosubstituted phenyl substituted with alkyl having one to 10 carbon atoms, cycloalkyl having five to 10 carbon atoms, halogen, hydroxyl, alkoxy having one to 14 carbon atoms, carbalkoxyalkoxy having three to 14 carbon atoms, cycloalkylalkoxy having six to 10 carbon atoms, cycloalkoxy having five to seven carbon atoms, or acyloxy selected from the group consisting of acetoxy, propionyloxy and butyryloxy, or disubstituted phenyl substituted with two alkyls having one to 10 carbon atoms, two halogens, two alkoxys having one to 14 carbon atoms, an hydroxyl and an alkyl having one to 10 carbon atoms, or an hydroxyl and a halogen.

3,928,618
ORAL COMPOSITIONS

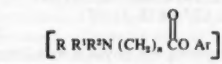
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 242,750, April 10, 1972. This application Mar. 21, 1974, Ser. No. 453,359

Int. Cl.² A61K 31/22

U.S. Cl. 424—311 **6 Claims**

1. An anti-microbial, anti-caries and anti-calculus oral composition consisting essentially of about 0.2–3% by weight of a nonionic organic surfactant and 0.01 to about 5% by weight of a quaternary ammonium aryl ester having the formula:



wherein R is a long chain alkyl of 12–18 carbon atoms, R^1 and R^2 are selected from the group consisting of methyl and ethyl, *n* is an integer from 1 to 6, Ar is an aryl selected from the group consisting of phenyl, naphthyl and phenyl and naphthyl substituted by a moiety selected from the group consisting of tri-halo and mono-nitro; and X is an anion selected from the group consisting of halide, sulfate and methosulfate, said nonionic organic surfactant being compatible with said quaternary ammonium aryl ester.

3,928,619
CERTAIN TERPENOID COMPOUNDS FOR INSECT CONTROL

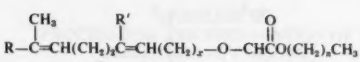
William S. Bowers, Geneva, N.Y., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 499,690, Aug. 22, 1974, which is a division of Ser. No. 365,295, May 23, 1973, Pat. No. 3,852,472, which is a division of Ser. No. 78,577, Oct. 6, 1970, abandoned. This application Nov. 26, 1974, Ser. No. 527,321

Int. Cl.² A01N 9/24

U.S. Cl. 424—314 **6 Claims**

1. A method of controlling the maturation of insects selected from the group consisting of *Tenebrio molitor* (L.) and *Epilachna varivestis* comprising contacting said insects at an immature stage of growth with an effective maturation inhibiting amount of a compound of the formula:



where

R and R′ are straight chain alkyls containing from one to two carbon atoms,

x is a number from 1 to 2, and

n is a number from 0 to 3.

3,928,620

PRESERVATION OF AGRICULTURAL PRODUCTS

Michel Armand Christian Courtade, Le Vesinet, and Bernard Raymond Pierre Ferveur, Ermont, both of France, assignors to The British Petroleum Company Limited, London, England

Filed July 3, 1974, Ser. No. 485,619

Claims priority, application France, July 3, 1973, 73.24373

Int. Cl.² A23K *3/03;* **A23L** *3/34;* **A01N** *9/04*

U.S. Cl. 424—317 **4 Claims**

1. A composition for protecting stored plant feed-stuffs against attack by micro-organisms which composition comprises about 5 to 80 percent by weight of a hydrocarbon mineral oil which has a density of 15°C. of 0.830 to 1.025, a Kinematic Viscosity at 50°C. of 8 to 600 centistokes, a Pensky Flash Point of 180° to 300°C. and an aniline point of −5° to +120°C., and abcut 95 to 20 percent by weight of propionic acid.

3,928,621

ANTIINFLAMMATORY 2-(2-AMINOALKYLAMINO)-1,2-IPHENYLETHANOLS

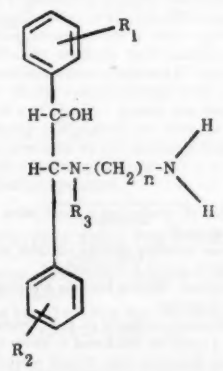
Alfred Boris, Parsippany, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 10, 1974, Ser. No. 513,798

Int. Cl. A61k *31/135*

U.S. Cl. 424—330 **9 Claims**

1. A method for treating a topical inflammation, which method comprises topically applying to the situs of said inflammation an effective amount of a compound of the formula



wherein R_1 and R_2 independently are hydrogen, halogen or C_{1-4} lower alkyl provided, however, that one of R_1 or R_2 is hydrogen; R_3 is hydrogen or C_{1-4} lower alkyl and n is an integer from 1 to 4 an isomer, an optical antipode or an acid addition salt thereof.

3,928,622

CERTAIN NON-TERPENOID JUVENILE HORMONE MIMICKING COMPOUNDS AND THEIR USE IN CONTROLLING INSECTS

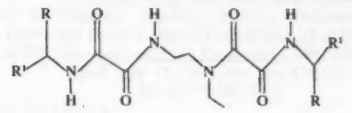
Ferenc Marcus Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 437,128, Jan. 28, 1974, Pat. No. 3,847,970. This application July 31, 1974, Ser. No. 493,289

Int. Cl.² A01N *9/20*

U.S. Cl. 424—320 **3 Claims**

1. A method of impeding the metamorphosis of Tenebrio molitor comprising applying thereto at any stage of its development an effective amount of a compound of the formula



in which R is alkyl having 1 to 2 carbon atoms and R^1 is methyl.

3,928,623

METHOD OF CONTROLLING INSECTS USING CERTAIN FORMAMIDINE COMPOUNDS CONTAINING TRIHALOMETHYL GROUPS

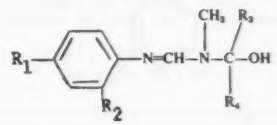
Ferenc M. Pallos, Walnut Creek, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 449,793, March 11, 1974, Pat. No. 3,862,229. This application Oct. 11, 1974, Ser. No. 514,169

Int. Cl.² A01N *9/20*

U.S. Cl. 424—326 **13 Claims**

1. A method of controlling insects consisting of applying to the habitat thereof an insecticidally effective amount of a compound of the formula:



wherein R_1 and R_2 and independently methyl or halogen; R_3 is selected from the group of $-CF_3$, $-CH_2Cl$, $-CFCl_2$ and $-CCl_3$ and R_4 is selected from the group of $-H$, $-CF_3$, $-CF_2Cl$, $-CFCl_2$ and $-CCl_3$.

3,928,624

PHENOL COMPOUNDS IN TREATING PAIN, FEVER AND INFLAMMATION

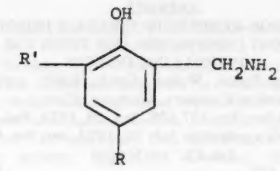
Edward J. Cragoe, Jr., Lansdale, and Everett M. Schultz, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 25, 1974, Ser. No. 464,003

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **9 Claims**

1. A method of treating a condition exhibiting at least one of the symptoms of pain, fever and inflammation which comprises the administration to a patient in need of such treatment a therapeutically effective amount of a compound of the formula:



wherein R is C_{3-7} loweralkyl and R′ is halogen, or the nontoxic pharmaceutically acceptable salt thereof.

3,928,625

1-CYCLOPROPYL-1-PHENYL-ω-AMINO-1-ALKANOLS AND 1-LOWER-ALKYLACYL DERIVATIVES FOR TREATING DEPRESSION

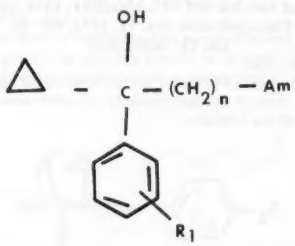
William John Welstead, Jr., Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 221,804, Jan. 28, 1974. This application Nov. 4, 1974, Ser. No. 526,033

Int. Cl.² A61K *31/445, 31/135*

U.S. Cl. 424—330 5 Claims

1. A process for treating depression which comprises administering to a living animal body requiring such treatment an effective amount of a compound having the formula:



Wherein:

Am is lower-alkylamino and di-lower-alkylamino,

R^1 is hydrogen, halogen, lower-alkoxy, lower alkyl or trifluoromethyl,

n is two or three, or a pharmaceutically acceptable salt thereof.

3,928,626

BENZYLAMINE ANALGESICS

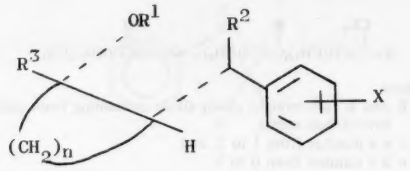
John P. Yardley, King of Prussia, and Peter B. Russell, Villanova, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 241,613, April 6, 1972, abandoned. This application Mar. 26, 1973, Ser. No. 345,037

Int. Cl.² A61K *31/40, 31/135, 31/535*

U.S. Cl. 424—330 5 Claims

1. The process for producing analgesia in warm-blooded animals which comprises administering to a warm-blooded animal in need thereof an amount sufficient to produce analgesia in said warm-blooded animal of a compound of the formula:



wherein R^1 is hydrogen or lower alkyl; R^2 is lower alkylamino, N-lower alkyl-N-methylamino, N-phenloweralkyl-N-methylamino, N-lower alkenylN-methylamino, N-cycloalkyl-methyl-N-methylamino, or N-oxo-N-lower alkyl-N-methylamino; R^3 is hydrogen or methyl; X is hydrogen, hydroxy, lower alkoxy, lower alkoxymethoxy or halo; and n is an integer of from 3–6; and a pharmacologically acceptable acid addition salt thereof.

3,928,627

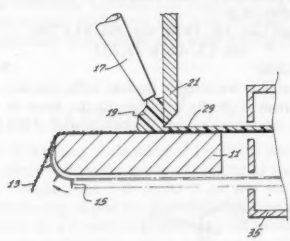
DECORATIVE WALL COVERING

Emery M. Mand, and Henry C. Shapiro, both of Los Angeles, Calif., assignors to Walter E. Heller Factors, Inc., Chicago, Ill.

Division of Ser. No. 165,269, July 22, 1971, Pat. No. 3,778,337. This application Aug. 9, 1973, Ser. No. 386,975

Int. Cl.² B32B *3/26, 5/18*

U.S. Cl. 427—358 3 Claims



1. The method of producing a decorative wall covering comprising the steps of

passing a woven material having variable strand thickness and separation across a first surface,

applying a relatively viscous backing material to one side of said woven material,

forcing said backing material to pass through said woven material at a constant thickness to cover strands of small thickness on the other side of said woven material, thus allowing said backing material and those strands having larger thicknesses to be clearly visible from the other side thereof while only said backing material is visible from said one side thereof,

spreading the backing material uniformly over the surface of said woven material to provide the wall covering with a substantially constant thickness across its area, and

curing the backing material to form a relatively resilient and pliable substance.

3,928,628
PROCESS FOR THE PREPARATION OF A SEROLOGICAL CARRIER

Szymon Kosmiderski, and Slaw Polak, both of Katowice, Poland, assignors to Wojewodzka Stacja Krwiodawstwa, Katowice, Poland

Filed June 27, 1973, Ser. No. 373,993
Claims priority, application Poland, July 6, 1972, 156528
Int. Cl.² C01B *31/14*; C09C *1/44*; G01N *31/00, 33/16*
U.S. Cl. 424—366 **5 Claims**

1. A process for the preparation of a carrier particularly used in serological reactions comprising burning active carbon in absolute alcohol, grinding the product obtained, and preparing a suspension in a buffer solution having a pH-value of 8.2.

3,928,629
COATING PROCESS

Grish Chandra, Penarth, Wales, and Colin Mostyn Rowland, Brussels, Belgium, assignors to Dow Corning Limited, Wales

Filed June 14, 1974, Ser. No. 479,245
Int. Cl.² B05D *3/02*
U.S. Cl. 427—387 **8 Claims**

1. A process for coating a surface which comprises applying thereto a composition having a viscosity not exceeding 4000 cS at 25°C and comprising (1) a polydiorganosiloxane having a viscosity in the range from 50 to 4000 cS at 25°C wherein from 0.1 to 15 per cent of the total silicon-bonded radicals are vinyl radicals, there being at least two vinyl radicals per molecule and at least 80 per cent of the remaining silicon-bonded radicals being methyl radicals, (2) an organohydrogenpolysiloxane having therein silicon-bonded hydrogen atoms and silicon-bonded organic radicals selected from methyl, ethyl and phenyl radicals, there being in the molecule on average at least three silicon-bonded hydrogen atoms and no more than 20 molar per cent of copolymeric diorganosiloxane units, and (3) a catalyst for the addition of SiH groups to silicon-bonded vinyl groups, said catalyst comprising one or more complexes of rhodium having the general formula

$$RhX_3(SR_2)_3 \quad \text{(i)}$$

or

$$Rh_2(CO)_4X_2 \quad \text{(ii)}$$

wherein each X represents a halogen atom and each R represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 8 inclusive carbon atoms or the R'_3SiQ- group in which Q represents a divalent aliphatic hydrocarbon radical having from 1 to 6 inclusive carbon atoms and R′ represents an alkyl, aryl, aralkyl or alkaryl radical having from 1 to 8 inclusive carbon atoms or a $(CH_3)_3Si-$ group, not more than one R′ per molecule being $(CH_3)_3Si-$, the ratio of silicon-bonded hydrogen atoms provided by (2) to silicon-bonded vinyl radicals provided by (1) being at least 0.5 : 1; and thereafter curing the applied composition.

3,928,630
ENZYMATIC PROCESSES FOR HYDROLYZING PROTEINS

Fulvio Perini, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed May 24, 1974, Ser. No. 473,255
Int. Cl.² C12B *1/00*
U.S. Cl. 426—7 **12 Claims**

1. A process of enzymatically hydrolyzing insoluble nonfunctioning protein, derived from a fish or animal source, comprising the steps of:

a. forming a liquid suspension of said protein:
b. adjusting the pH of said suspension to about from 7.5 to 9.5, by the addition of calcium hydroxide;
c. contacting said protein with an alkaline active protein proteolytic enzyme and maintaining temperature of said suspension in the range of about from 35° to 60°C and maintaining the pH in the range of about from 7.2 – 8, for 12 to 24 hours, by the addition of calcium hydroxide, thereby hydrolyzing said protein;
d. adjusting the pH of the suspension to about 7.0 by addition of phosphoric acid to form a particulate precipitate of calcium phosphate; and
e. filtering the product mixture of step (d), using the calcium phosphate precipitate formed in step (d) as a filter aid thereby yielding a clear, virtually colorless and tasteless hydrolysate rich filtrate and a filter cake comprising insoluble proteins, carbohydrates and calcium phosphate.

3,928,631
PROCESS FOR WET MILLING CORN

Jere E. Freeman, Hinsdale; Mukhtar Abdullah, Downers Grove, and Byron J. Bocan, Countryside, all of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed June 17, 1974, Ser. No. 479,923
Int. Cl.² C12C *9/00*
U.S. Cl. 426—18 **11 Claims**

1. In a process for the wet milling of corn kernels including the steps of steeping the kernels in an aqueous medium for a period of time sufficient to soften the kernels; degerminating the softened kernels by milling and removing the germ; separating the degerminated kernel from the steep water; comminuting the degerminated kernel to a fine mash; separating the fiber and gluten fractions from the comminuted mash and dewatering the fiber and gluten fractions; the improvement comprising: adding to the process mixture at the temperature of the wet milling process immediately before, concurrently with or subsequent to the milling of the softened kernel and prior to the dewatering step a glucoamylase enzyme preparation in an amount sufficient to provide at least about 0.005 glucoamylase unit of activity per gram of solids in the particular process mixture to which the preparation is added and allowing the glucoamylase to react with the mixture for a period of time sufficient to increase the rate and extent of dewatering of the fiber and gluten fractions.

3,928,632
EGG SUBSTITUTE PRODUCT

Ernest Glaser, Moraga, and Philip F. Ingerson, Merced, both of Calif., assignors to Avoset Food Corporation, Oakland, Calif.

Filed July 31, 1974, Ser. No. 493,450
Int. Cl.² A23L *1/30*
U.S. Cl. 426—72 **5 Claims**

1. A liquid egg substitute product comprising from about 65 to about 90 percent egg white, from about 0.5 to about 5.0 percent of a nontoxic vegetable oil composed of glyceryl esters of unsaturated higher fatty acids, and from about 0.05 to about 1.0 percent of a fatty acid lactylate alkali metal salt, said product being free of egg yolk.

3,928,633
SWEETENING COMPOSITION AND PROCESS THEREFOR

Myron D. Shoaf, and Lamonte D. Pischke, both of Danbury, Conn., assignors to General Foods Corporation, White Plains, N.Y.

Filed Dec. 3, 1973, Ser. No. 421,295
Int. Cl.² A23L *1/236*
U.S. Cl. 426—96 **9 Claims**

1. Process for stabilizing L-aspartyl-L-phenylalanine methyl ester crystals into a particulate form adapted to be intermixed with other powderous materials and be free-flowing therewith which comprises admixing said ester crystals and a fusing and matrix-forming material having a moisture content less than 10%, said material being molten at a temperature at or below 370°F, solidifying into a solid mass when cooled to below its melting point and retaining a thermosetting solid condition at ambient conditions; heating the admixture of said ester crystals and said fusing and matrix-forming material to a temperature sufficient to convert said fusing and matrix-forming mate-

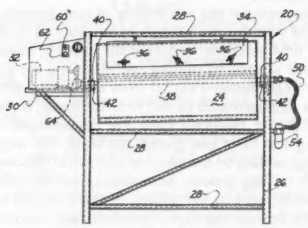
rial into a continuous molten condition but below the melting point of the ester crystals, wherein the ester crystals are discretely distributed; cooling the molten mass to fuse the same and permanently fix the ester crystals in a dispersed phase; and sub-dividing the cooled mass to a particular size thereby producing particles which encapsulate the crystals distributed therein.

3,928,634

METHOD FOR MARINATING POULTRY PRODUCTS

Geno N. Gasbarro, 1305 Noe-Bixby Road, Columbus, Ohio 43227

Filed Nov. 16, 1973, Ser. No. 416,692
Int. Cl.² A23L *1/31*
U.S. Cl. 426—281 5 Claims



1. A method of marinating poultry food products comprising the steps of placing poultry food products in a closed chamber containing a predetermined quantity of a liquid marinating solution and having significant air space above the level of said marinating solution; tumbling said food products while alternately immersed in said marinating solution and exposed to said air space in said chamber by rotating said chamber at speeds between approximately 3 to 70 r.p.m. while withdrawing air from said chamber to expose said products to a negative pressure of at least 20 inches of mercury for a time interval greater than 2 but less than 30 minutes whereby said products are caused to absorb at least two and one half percent by weight of the marinating solution during said tumbling.

3,928,635

METHOD FOR PREPARATION OF PEANUT FLAKES FROM PEANUT KERNELS

Ioe Ohta, Tokyo; Akira Matsunobu; Masafumi Nishizawa, both of Kobe; Hayato Kubota, Izumiohtsu, and Kenshi Sakamoto, Osaka, all of Japan, assignors to Ton Co., Ltd. and Fuji Oil Company, Ltd., both of, Japan

Filed July 15, 1974, Ser. No. 488,847
Claims priority, application Japan, July 19, 1973, 48-82265
Int. Cl.² A23L *1/36*
U.S. Cl. 426—312 8 Claims

1. A method for preparation of peanut slices from peanut kernels, which comprises steps of dividing each of skinned raw peanuts into a pair of peanut fractions each having a moisture content of 6 to 14 percent, slicing said peanut fractions in a direction substantially parallel to the confronting surface between said peanut fractions of each pair thereby providing sliced peanuts, steaming the sliced peanuts and drying the same.

2. A method as claimed in claim 1, wherein the peanut fractions are contacted with ethanol.

3,928,636

COFFEE EXTRACTION PROCESS

Saul N. Katz, Monsey, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Apr. 30, 1973, Ser. No. 356,032
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² A23F *1/08*
U.S. Cl. 426—434 7 Claims

1. In a method for producing coffee extract wherein progressively fresher roasted and ground coffee is countercurrently contacted with an aqueous extraction liquid in the extraction columns of a percolator set and wherein said extraction liquid is fed to the spent stage extraction column containing the most extracted coffee and drawn off from the fresh stage extraction column containing the least extracted coffee, the improvement comprising feeding the entire portion of the aqueous extraction liquid fed to said spent stage extraction column at temperatures below about 120°F, and heating the exiting extraction liquid from said spent stage extraction column to above 300°F before contacting the next progressively fresher coffee.

3,928,637

METHOD OF TREATMENT OF ANIMAL FLESH

Ali Khayat, Huntington Beach; George W. Courtney, San Pedro, and Howard J. Dunn, Lomita, all of Calif., assignors to Ralston Purina Company, St. Louis, Mo.

Division of Ser. No. 328,797, Feb. 1, 1973, Pat. No. 3,851,078. This application July 19, 1974, Ser. No. 479,323The portion of the term of this patent subsequent to Nov. 26, 1991, has been disclaimed.
Int. Cl.² A23L *1/325*
U.S. Cl. 426—437 7 Claims

1. A method of treating tuna-type fish to reduce the mercury content thereof comprising forming a slurry of the tuna fish, supplying a predetermined quantity of material to the slurry sufficient to reduce the mercury content, the material having a free sulfhydryl group or yielding a sulfhydryl bond, heating the slurry at a temperature and for a time sufficient to coagulate the protein of the tuna fish and separating the tuna flesh from the slurry to obtain tuna flesh having a reduced mercury content.

3,928,638

METHOD OF MAKING TACO SHELLS

Daniel T. Stickle, 310 E. 40th St., Lubbock, Tex. 79404

Division of Ser. No. 222,493, Feb. 1, 1972, Pat. No. 3,785,273. This application Aug. 20, 1973, Ser. No. 390,164
Int. Cl.² A21D *10/00*
U.S. Cl. 426—439 1 Claim

1. The method of cooking a plurality of food products which each have a major portion of their respective surface areas disposed substantially parallel to a respective flat plane, the method comprising the steps of:

loading the products on a series of carriers longitudinally spaced from each other at a loading station,

moving the loaded carriers together to decrease the space between them and the products on them,

disposing the products on the carriers with their respective flat planes in line with and transverse to a substantially horizontal line,

advancing the loaded carriers along a substantially horizontal line at the decreased spacing through grease,

removing the loaded carriers from the grease,

increasing the space between the loaded carriers, and

removing the products from the spaced-apart carriers.

3,928,639

PROCESS FOR DEHYDRATING FROZEN FOOD PARTICLES

Nils Tangsrud, and Ole Gabriel Devik, both of Trondheim, Norway, assignors to Sintef, Trondheim, Norway

Continuation of Ser. No. 782,760, Dec. 10, 1968, abandoned. This application May 24, 1973, Ser. No. 363,337

Claims priority, application Norway, Dec. 18, 1967, 171037/67

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] A23B *1/04, 3/04*

U.S. Cl. 426—444 3 Claims

1. In a process for preparing a dehydrated powder of a meat or fish product by carrying out in sequence the steps of freezing the product to be dehydrated, subdividing it into a powder of fibrous particles, distributing this powder on a carrier means and drying it by contacting it at atmospheric pressure with a gaseous drying agent having a temperature above the thawing point of the frozen powder and moving relative to the fibrous particles of the powder, the improvement wherein said powder is distributed as a layer on a porous carrier means through which said drying agent is passed with an even distribution and with a velocity of about 0.5 m/sec. which is sufficiently high to lift and maintain the powder layer in porous condition but sufficiently low so that said powder is not carried away by the flow of drying agent, said drying agent causing a thawing and drying of the fibrous particles which result in adhesion between the individual particles where they touch each other to form a firm porous mat having a thickness of about 15 mm, and after the formation of said porous mat the velocity of said drying agent is gradually increased up to about 5 m/sec. and the drying is continued at said increased velocity to bring the dry content thereof up to about 95 percent, after which said mat is torn up to a dehydrated powder.

3,928,640

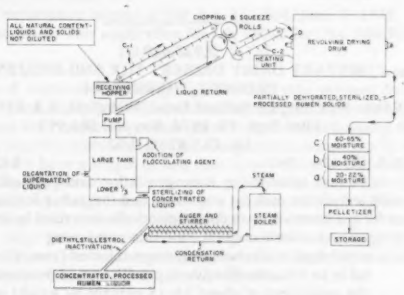
PRODUCTION OF SUBSTANTIALLY FULL-DIET BEEF CATTLE FEED THROUGH PROCESSING OF THE RUMEN CONTENT OF SLAUGHTERED CATTLE

Paul A. Stahler, Jordan, Minn. 55352

Continuation-in-part of Ser. No. 12,080, Feb. 17, 1970, abandoned, Continuation-in-part of Ser. No. 667,324, Sept. 7, 1967, Pat. No. 3,545,977. This application June 15, 1973, Ser. No. 370,459

Int. Cl.[2] A23B *4/04*

U.S. Cl. 426—465 4 Claims



1. The process of treating the rumen content per se without dilution or additives of slaughtered cattle to produce at least 75 percent of full diet beef cattle feed requirements which consist in:

obtaining the whole rumen contents from slaughtered cattle without addition of dilutants or other substances, the whole rumen content including liquid and solid ingredients,

mechanically removing at least 80% of the liquid ingredients from the solid and fibrous ingredients of said whole rumen content, said separated solid ingredients including matted fibers, adhering globules, coagulants, and emulsions, subdividing the separated fibrous materials, and

drying the said fibrous and adhering materials by conveying said materials through a dryer heated at the entrance end by a forced air heater at a temperature of from 2000°F. to 3000°F, said material being conveyed through said dryer for a period of from seven to ten minutes.

3,928,641

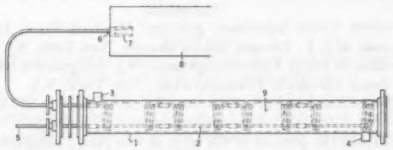
METHOD OF COLLECTING PROTEIN FILAMENTS

Ralph A. Hoer, Ballwin, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Filed Oct. 29, 1974, Ser. No. 518,765

Int. Cl.[2] A23P *1/00*

U.S. Cl. 426—506 8 Claims



1. In a method of continuously forming discrete elongated protein filaments from proteinaceous material wherein an aqueous slurry of the proteinaceous material is formed having a proteinaceous solids content of between about 0.5 and 35 percent by weight, the discrete elongated filaments being formed by continuously conducting the slurry under pressure through a heat exchange zone and in said zone heating the slurry to a temperature which is above 240°F. but which is less than that which will degrade the protein, whereby the protein is subjected to such temperature for a sufficient period of time so that elongated tender filaments are thereafter separated from the remaining constituents of the slurry and the heated slurry is continuously removed from said zone through a back pressure creating orifice whereby the elongated filaments and remaining constituents of the slurry are discharged into a collecting zone and in the collecting zone the discrete filaments are separated from the remaining constituents of the slurry, the improvement comprising; controlling the discharge of said filaments into the collecting zone by confining the stream of said filaments being discharged from said orifice into the collecting zone to within a total angle of between about 4 and 90° said angle being measured from an axis through the center of said orifice, in order to maintain discreteness of the filaments in said collecting zone.

3,928,642

PROCESS FOR LYSING MYCELIAL WASTE

Alfred W. Hubert, West Lafayette, and Ralph T. Russell, Lafayette, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jan. 22, 1975, Ser. No. 542,990

Int. Cl.[2] A23K *1/00*

U.S. Cl. 426—521 8 Claims

1. A process for lysing mycelial waste obtained from the production of antibiotics, which comprises heating the mycelial waste at a temperature of from about 140° to about 200°C., at a pressure of from the equilibrium pressure to about 2,000 p.s.i.g., and at a pH of from about 2 to about 10, until substantially no antibiotic activity remains.

3,928,643

METHOD OF PRODUCING A BEEF FLAVOR

Kyosuke Ishiguro, Kawasaki, and Takehiko Ichikawa, Fujisawa, both of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,273
Claims priority, application Japan, Aug. 20, 1973, 48-93194
Int. Cl.² A23L *1/226, 1/227*
U.S. Cl. 426—533 5 Claims

1. A method of preparing a seasoning composition which comprises heating a mixture of 0.01 part to ten parts ribose or ribose-5-phosphate with one part plasma solids of beef cattle or pigs' blood at 60° to 250°C for 15 seconds to 3 hours until the mixture assumes the flavor of cooked beef, said parts being by weight.

3,928,644

NOVEL VEGETABLE FLAVORED FOODSTUFF AND VEGETABLE FLAVOR COMPOSITIONS CONTAINING 2-PHENYL-4-PENTENAL AND/OR DIMETHYL ACETAL THEREOF

William Lewis Schreiber, Jackson; Manfred Vock, Locust, both of N.J.; Edward Joseph Shuster, New York, N.Y., and Alan O. Pittet, Atlantic Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 283,651, Aug. 25, 1972, Pat. No. 3,852,482. This application Oct. 2, 1974, Ser. No. 511,429The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.
Int. Cl.² A23L *1/226*
U.S. Cl. 426—535 7 Claims

1. A process for altering the organoleptic properties of a foodstuff which comprises adding thereto a small but effective amount to enhance a vegetable flavor or to impart thereto a vegetable flavor of 2-phenyl-4-pentene derivatives selected from the group consisting of 2-phenyl-4-pentenal and 2-phenyl-4-pentenal dimethyl acetal.

3,928,645

ENHANCING RED-BERRY FLAVOR WITH 4-(2,6,6-TRIMETHYL-1,3-CYCLOHEXADIEN-1-YL)-2-BUTANONE AND 4-(6,6-DIMETHYL-2-METHYLENE-3-CYCLOHEXEN-1-YL)-2-BUTANONE

Braja Dulal Mookherjee, Matawan; Robert Walter Trenkle, Bricktown; Manfred Hugo Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 386,320, Aug. 7, 1973, Pat. No. 3,872,031. This application Apr. 22, 1974, Ser. No. 462,748
Int. Cl.² A23L *1/235*
U.S. Cl. 426—538 1 Claim

1. A process for enhancing the red-berry flavor of a foodstuff comprising adding thereto from 0.02 ppm up to 50 ppm by weight based on the total weight of foodstuff of a mixture of 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanone and 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanone, the weight ratio of 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanone:4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanone being 90:10.

3,928,646

METHOD FOR BLENDING TEMPERATURE SENSITIVE INGREDIENTS IN THE PRODUCTION OF DOUGH

Howard A. Hartley, Columbus, Ohio, assignor to Cannell Auto-Process Corporation, Columbus, Ohio

Filed Oct. 11, 1972, Ser. No. 296,679
Int. Cl.² A21D *8/02*
U.S. Cl. 426—549 3 Claims

1. A continuous process of producing high shortening content dough which comprises blending and mixing the dough-forming ingredients which include shortening in a paste or semi-liquid form and dry ingredients and simultaneously blending and mixing therewith particles of a cooling substance that does not form an ingredient of the dough, said cooling substance combined with the dry ingredients and mixed therewith prior to mixing and blending with the shortening to cool and solidify the shortening so as to provide nucleating surfaces for the dry ingredients.

3,928,647

DRY PREPARED MUFFIN MIXES COMPRISING IMPACT-MILLED HARD WHEAT FLOUR

Monoj Kumar Gupta, Somerset, N.J., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 23, 1973, Ser. No. 354,029
Int. Cl.² A21D *10/00*
U.S. Cl. 426—554 4 Claims

1. A pulverulent and free-flowing dry muffin mix suitable for the preparation of muffins, said mix comprising flour; chemical leavening agent; sugar; and shortening; said flour comprising at least about 80% by weight of impact-milled hard wheat flour.

3,928,648

METHOD AND COMPOSITION FOR LOW PH WHIPPED TOPPINGS

Howard D. Stahl, Hartsdale, and Rex J. Sims, Pleasantville, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed June 12, 1974, Ser. No. 478,656
Int. Cl.² A23L *1/00*
U.S. Cl. 426—564 31 Claims

1. An improved method for preparing a dry whipped topping mix from a stable emulsion which comprises:

forming an emulsion comprising fat, water, carbohydrate and an amount of an emulsifier system which is effective to provide a stable emulsion, the emulsifier system comprising a minor amount of a strongly-hydrophilic, anionic emulsifier and a major amount of a nonionic emulsifier, the strongly-hydrophilic anionic emulsifier and the nonionic emulsifier being present at a weight ratio of within the range of from about 1:15 to about 1:1;

drying the emulsion; and thereafter

adding an amount of a destabilizing agent to the emulsion effective to partially destabilize the emulsion upon rehydration.

3,928,649

DIETARY DAIRY DESSERT MIX AND FROZEN PRODUCT THEREFROM

Edwin W. Cobb, 21 Holland Drive, Wakefield, R.I. 02879

Filed Sept. 18, 1974, Ser. No. 506,993
Int. Cl.² A23G *9/02*
U.S. Cl. 426—565 9 Claims

1. A mix suitable for homogenization and pasteurization with anhydrous milk fat and water and thereafter for freezing to form a frozen dietary dairy dessert characterized by low fat, sodium and calorie content, said mix comprising:

a. a polyhydric alcohol component selected from: (i) sorbitol in an amount effective to provide in said frozen dessert the equivalent of about 14–18 percent by weight of a 70 percent by weight aqueous sorbitol solution, or (ii) a mixture of sorbitol and mannitol in an amount effective to provide in said frozen dessert the equivalent of about 5–15 percent by weight of a 70 percent by weight aqueous sorbitol solution and about 3–15 percent by weight mannitol, of which the amount of one of said polyhydric alcohols is at least 14 percent by weight;

b. non-fat milk solids in an amount effective to provide about 10–15 percent by weight thereof in said frozen dessert; and

c. an effective amount of a low salt content, food quality stabilizer.

3,928,650

PASTY DRY PRODUCT AND PROCESS FOR MAKING SAME

Hans Bohrmann, Talheim, and Gerhard Schneider, Flein, both of Germany, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed July 24, 1974, Ser. No. 491,448
Int. Cl.² A23L *1/187*
U.S. Cl. 426—579 10 Claims

1. A pasty dry product for the preparation of desserts, which when stirred into boiling aqueous liquids and cooled sets and forms a dessert comprising a mixture of (a) triglycerides of the unbranched fatty acids naturally present in edible oils and edible fats, in an amount of between about 20 and about 35 percent by weight, said triglycerides having melting points not higher than 40°C, (b) ungelatinized starch, in an amount of between about 15 and 35 percent by weight, (c) at least one sugar, in an amount of between about 30 and 50 percent by weight, and (d) at least one emulsifier, in an amount of up to about 5 percent by weight.

3,928,651

METHOD FOR FORMING PROCESSED MEATS

Leonhard H. Froehlich, and Arthur M. Dowell, Jr., both of Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Aug. 12, 1974, Ser. No. 496,483
Int. Cl.² A23L *1/31*
U.S. Cl. 426—641 2 Claims

1. A method of treating meat products which consists of forming said meat products into desired shapes, tying said formed meat products with an edible binding string consisting of a twisted tubular casing of tanned reconstituted edible collagen, said casing having a film thickness of about 1–3 mils, a width of from about 0.2.5–1.5 inches, and twisted about 0.25–4 revolutions per inch of string, and cooking said tied meat products until said meat products and string are tender and edible.

3,928,652

METHOD OF PREPARING A FISH PRODUCT

Kent J. Lanter, Belleville, Ill., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 367,284, June 5, 1973, abandoned. This application May 6, 1974, Ser. No. 466,925
Int. Cl.² A23L *1/325*
U.S. Cl. 426—643 8 Claims

1. A method of forming a grated tuna-type product from tuna flesh and protein filaments comprising the steps of: preparing heat settable synthetic protein filaments, chopping the heat settable filaments into discrete particles, substantially all of which have a length of less than about ⅜ inches, adjusting the liquid content of the discrete particles to about 75 – 85 percent by weight and forming a mixture of said adjusted particles with tuna flesh, the discrete particles being present in a range from 1-60 percent by weight of the mixture; grating the mixture, placing the grated mixture into cans and retorting the mixture to provide a tuna-type product.

3,928,653

COLLAGEN SLURRY CONTAINING PARTIAL FATTY ACID ESTERS OF GLYCERIN

Arthur M. Dowell, Jr., and Arthur L. Reitemeier, both of Danville, Ill., assignors to Tee-Pak, Inc., Chicago, Ill.

Filed Feb. 5, 1975, Ser. No. 547,300
Int. Cl.² A23L *1/31*
U.S. Cl. 426—657 11 Claims

1. In a process for preparing a slurry comprising edible collagen and water for extrusion into an artificial sausage casing by

comminuting a collagen source for forming a collagen pulp;

swelling said collagen pulp with an edible acid for releasing the collagen fibrils; and

mixing said collagen pulp in water for forming a slurry;

the improvement for reducing fiber clumps in said slurry and improving the productivity of the casing made from such slurry which comprises adding to said collagen pulp prior to swelling and blending therewith a partial fatty acid ester of glycerin, said partial fatty acid ester of glycerin being added in an amount effective for selectively reducing said fiber clumps.

3,928,654

METHOD AND FORMULATION FOR PREVENTING SNOW AND ICE ACCUMULATION

Anthony J. Bonnanzio, Westport Road, Fairfield, Conn. 06430

Continuation-in-part of Ser. No. 314,530, Dec. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 219,829, Jan. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 102,542, Dec. 29, 1970, abandoned. This application Apr. 19, 1974, Ser. No. 462,339
Int. Cl.² C09K *3/18*
U.S. Cl. 427—8 5 Claims

1. A method for treating walkways, roadways and driveways to prevent the accumulation of ice and snow thereupon, said method comprising applying to said surface a liquid composition consisting essentially of 30 to 45 percent by volume of at least one alkylene glycol having from 2 to 6 carbon atoms in water, and an organic dye compatible therewith selected from the group consisting of aromatic sulfonic acids, nitro-sulfonic acids, mono-azo sulfonic acids, diazosulfonic acids, and anthraquinone sulfonic acids, in an amount sufficient to impart to said formulation a visible coloration when said formulation is in contact with the surface and such that said coloration disappears in a uniform manner and proportionately with the loss of resistance to prevent such accumulation.

3,928,655

ELECTROSTATIC POWDER COATING METHOD

Masakazu Iwasa; Hajime Miyatuka; Kazuo Horikawa, all of Asaka, and Tomisaku Wakabayashi, Odawara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 28, 1974, Ser. No. 446,756
Claims priority, application Japan, Mar. 5, 1973, 48-25846
Int. Cl.² G03G *13/08*
U.S. Cl. 427—21 18 Claims

1. An electrostatic powder coating method comprising: forming a charged unfixable powder image on an electrically conducting substrate; electrostatically spraying a second charged powder having the same charge polarity as the polarity of said unfixable powder image over the unfixable powder image bearing surface of said substrate to form a layer of said second powder; fixing said second powder layer; and removing, subsequent to the fixing of said second powder layer, said unfixable powder image.

3,928,656

METHOD OF DEVELOPING ELECTROSTATIC LATENT IMAGES WITH PRESSURE SENSITIVE TONER

Stephen Strella, Pittsford, and Meurig W. Williams, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,441, Dec. 30, 1971, Pat. No. 3,804,764. This application Dec. 6, 1973, Ser. No. 422,399

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03G 7/00, 13/00; B44D 1/94

U.S. Cl. 427—22 10 Claims

1. A process for producing a final toner image comprising: fixing a toner in image configuration to a support by the application of pressure, said toner comprising a finely divided colored resin, said resin comprising an amorphous weakly crosslinked polymer having a bond strength from about 2 to about 30 kcal/mole and a Tg of greater than about −20° C.

2. A process for rendering an electrostatic latent image visible, comprising:

developing the electrostatic latent image with a finely divided colored resin, said resin comprising an amorphous weakly crosslinked polymer having a crosslink bond strength from about 2 to about 30 kcal/mole and a Tg of greater than about −20° C.

3,928,657

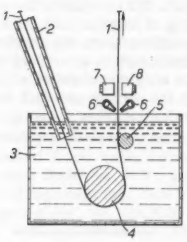
STRIP SHAPE CORRECTION ON GALVANISING LINE

David Alun Armstrong, Swansea, and Kenneth Gill Lewis, Port Talbot, both of Wales, assignors to British Steel Corporation, London, England

Division of Ser. No. 134,266, April 15, 1971, Pat. No. 3,784,072. This application Aug. 31, 1973, Ser. No. 393,319

Int. Cl.[2] H01F 1/00

U.S. Cl. 427—47 3 Claims



1. In a method of coating a moving ferromagnetic metal sheet with a layer of material of uniform thickness wherein there is applied to at least one side of the moving metal sheet at a coating station a layer of liquid coating material of greater thickness than the thickness to remain on the sheet as the finish coating, and the coated sheet is moved past a rectilinear station where a portion of the coating material is removed, the improvement comprising the steps of controlling the moving ferromagnetic metal sheet to conform momentarily to a predetermined plane parallel with and disposed closely adjacent said rectilinear coating removal station by detector disconformity of the sheet from the predetermined plane, and applying directly to the sheet at the region of the disconformity a force which has a component normal to the sheet surface and which is dependent on the degree of disconformity, the force being a magnetic field of such size and magnitude as to urge the sheet to conform to the plane, and removing a portion of said coating material while said moving sheet is momentarily conformed to said predetermined plane whereby a finish coating layer of uniform thickness remains on the moving sheet.

3,928,658

METHOD OF PROVIDING TRANSPARENT CONDUCTIVE ELECTRODES ON A TRANSPARENT INSULATING SUPPORT

Antonius Marinus van Boxtel, and Cornelis Jan Gerritsma, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

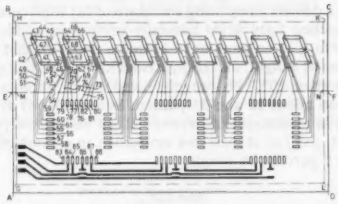
Filed Apr. 25, 1973, Ser. No. 354,510

Claims priority, application Netherlands, Apr. 28, 1972, 7205767

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] H05K 3/02

U.S. Cl. 427—108 13 Claims



1. A method of producing a device comprising a transparent insulating support which is provided with a pattern of conductors of a transparent conductive material comprising the steps of:

a. forming on said support auxiliary layer comprising a metal layer containing at least one recess corresponding to said pattern of conductors;

b. forming a transparent conductive layer on said auxiliary layer and in each said recess;

c. forming a solderable metal layer on a part of the exposed surface of said transparent conductive layer; and

d. selectively dissolving said auxiliary layer so as to remove said auxiliary layer and the portion of said transparent conductive layer overlying said auxiliary layer, said conductor pattern comprising a first part having only a transparent layer and a second part having multiple layers comprising both at least one lowermost, support-adjoining transparent layer and one solderable layer therabove.

3,928,659

METHODS OF AND MEANS FOR VACUUM DEPOSITION

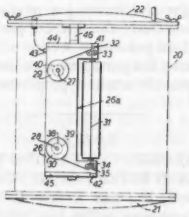
Alexander Samuel Baxter, Broomhill House, Great Brickhill, Bletchley, Buckinghamshire, England

Continuation-in-part of Ser. No. 113,313, Feb. 8, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,424

Claims priority, application United Kingdom, Feb. 12, 1970, 6789/70

Int. Cl.[2] C23C 13/02, 13/04

U.S. Cl. 427—132 4 Claims



1. A method of coating a surface of an article by the evaporation of a vaporizable coating material in a vacuum chamber, which method comprises the steps of carbonizing or graphitiz-

ing organic material to provide a flexible elongated electrically conductive heater element in the form of a tape which is inextensible under the conditions to which it is subjected in carrying out said method, forming a solid coating on the surface of said element with a quantity of said vaporizable material sufficient to substantially wholly cover the surface of said heater but insufficient to permit the formation of globules of said coating material more than a few microns in size, said vaporizable material having the property of not wetting the heater when at the vaporizing temperature of said material, said coated heater element retaining its flexibility when coated, disposing said article and said element with said material thereon in said chamber, providing electrical connections to regions of said element spaced along its length, heating that part of the element between said connections by passing electrical current through said connections and said part to bring said part of the element to a temperature which causes uniform vaporization of the material from substantially the full length of said part and deposition of said vaporized material on said surface of the article and, while maintaining a vacuum in said chamber, moving said element lengthwise to bring a different part of the element between said connections, and heating said different part.

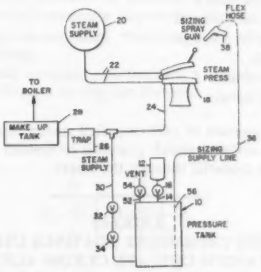
3,928,660
DRY CLEANING FINISHING METHOD AND APPARATUS

John M. Alderson, 21332 Bulkhead Circle, Huntington Beach, Calif. 92646, and Raymond H. Heiskell, 30 Laurel Court, San Mateo, Calif. 94401

Continuation-in-part of Ser. No. 268,885, July 3, 1972, abandoned. This application Feb. 26, 1974, Ser. No. 446,007

Int. Cl.[2] B32B *27/00, 17/06*

U.S. Cl. 427—248 **11 Claims**



1. A method for producing and applying a homogenized mixture of an additive material and chemically pure water to a garment being processed by an apparatus supplied with steam under pressure, said method comprising the steps of:

providing a closed tank having at least two inlets and one outlet; moving chemically pure water formed from condensed steam at said apparatus to one of said inlets to said tank;

supplying a preselected additive material to said tank through its other said inlet;

utilizing the pressure of the steam supplied to said apparatus for forcing said chemically pure water into said tank to mix with said additive material therein;

further utilizing the pressure of the steam supplied to said apparatus for forcing the mixture of additive material and water from said tank and directing it to a dispensing means on a conduit connected to said outlet of said tank; and

applying the mixture of additive material and water with said dispensing means to a garment.

3,928,661
SELECTIVE COATING OF A SUBSTRATE WITH POLY(ARYLENE SULFIDE)

David E. Higbee, and William D. Powell, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 1, 1973, Ser. No. 366,245

Int. Cl.[2] B05D *1/32*

U.S. Cl. 427—259 **19 Claims**

1. A process for selectively coating a first portion of a surface of a substrate with a poly(arylene sulfide) composition, said process comprising:

coating a second portion of said surface of said substrate with a masking composition comprising at least one member of the group consisting of diatomaceous earth, alkaline earth carbonates, and alkaline earth silicates,

applying a coating of said poly(arylene sulfide) composition to said first portion and at least part of the thus masked second portion of said substrate,

heating the thus-coated substrate to a temperature sufficient to cure said poly(arylene sulfide) composition,

stripping said poly(arylene sulfide) composition from the masked second portion of said surface of said substrate, and

treating said substrate to remove said masking composition.

14. The process of claim **13** wherein said poly(arylene sulfide) is poly(phenylene sulfide).

3,928,662
PROCESS FOR THE PRODUCTION OF METAL CONTAINING CERAMICS

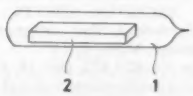
Yasuhisa Kaneko, Toyota; Yoshiro Komiyama, Okazaki; Katsumi Kondo; Fumiyoshi Noda, both of Toyota, and Kunihiko Uchida, Okazaki, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 21, 1974, Ser. No. 435,159

Claims priority, application Japan, Jan. 24, 1973, 48-010108

Int. Cl.[2] C23C *1/00;* **C03C** *17/06*

U.S. Cl. 427—294 **6 Claims**



1. Method of impregnating a porous sintered ceramic material with metal, which method comprises the steps of sealing said material in an evacuated glass capsule, submerging said capsule in a molten metal, and breaking said capsule while applying pressure to said metal and capsule to impregnate said sintered ceramic material with said metal.

3,928,663
MODIFIED HECTORITE FOR ELECTROLESS PLATING

John Peter Redmond, Mechanicsburg; Daniel Marshall Andrews, Harrisburg, both of Pa.; Charles Parsons Brooks, Rural Hall, N.C.; Dominic A. Cinalli, Burlington, N.J., and Joseph Francis Merlina, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 1, 1974, Ser. No. 457,012

Int. Cl.[2] C23C *3/02;* **B05D** *3/04*

U.S. Cl. 427—304 **2 Claims**

1. In a method for rendering a substance selfcatalytic to deposition of electroless metal in which hectorite is employed and the replaceable cations in said hectorite are exchanged with a cation of a metal selected from the group consisting of nickel, copper, palladium, platinum, gold, silver, rhodium and iridium, the improvement which comprises: modifying the lattice structure of said hectorite to stabilize it against swelling

when immersed in aqueous electroless solutions by reducing the exchange metal cations at elevated temperatures in a reducing atmosphere consisting essentially of a compound selected from the group consisting of hydrogen, carbon monoxide, hydrogen sulfide and cracked ammonia.

3,928,664

OZONE TREATMENT OF ELASTOMERS

Robert Edward Tarney, Hockessin, and John Joseph Verbanc, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 17, 1973, Ser. No. 324,495

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B05D *3/00*

U.S. Cl. 427—322 **10 Claims**

1. A process for modifying the surface of a vulcanized elastomer to insure adequate paint adhesion thereto which comprises contacting a sulfur-cured ethylene, propylene, nonconjugated diene elastomer containing reinforcing carbon black in amounts of at least 50 parts per hundred parts of elastomer with a gaseous atmosphere containing at least about 100 parts per million ozone for a time sufficient to oxidize said surface thus conditioning the surface for painting.

2. A process of claim **1** wherein the elastomer contains about from 75 to 200 parts of carbon black per hundred parts of elastomer.

3. A process of claim **2** wherein the elastomer contains about from 10 to 100 parts of oil per hundred parts of elastomer.

10. A process of claim **3** wherein the additional subsequent steps of applying a film of flexible resin-based paint selected from the group consisting of acrylic resin, alkyd resin, polyester resin, polyurethane or plasticized nitrocellulose lacquer to the modified surface of the elastomer, and baking the surface to cure said resin paint film thereon, thereby producing an article in which paint cannot be removed therefrom without tearing the surface of the elastomer.

3,928,665

METHOD OF PREPARING DIFFUSION TRANSFER RECEIVING SHEETS

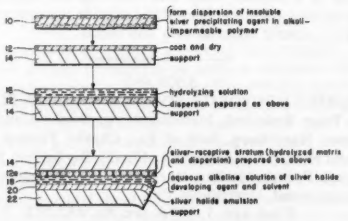
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 675,472, Oct. 16, 1972, Pat. No. 3,671,241, which is a continuation-in-part of Ser. No. 437,799, March 8, 1965, abandoned. This application June 19, 1972, Ser. No. 264,257

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] G03C *5/54, 1/48*

U.S. Cl. 427—339 **22 Claims**


form dispersion of insoluble silver precipitating agent in alkali-impermeable polymer
coat and dry
support
hydrolyzing solution
dispersion prepared as above
support
silver-receptive stratum (hydrolyzed matrix and dispersion) prepared as above
aqueous alkaline solution of silver halide developing agent and solvent
silver halide emulsion
support

1. A method of forming an image-receiving element for use in forming images in silver by a diffusion transfer process, said method comprising the steps of:

a. forming a dispersion comprising a solution of an alkali-impermeable polymer with an insoluble silver precipitant dispersed therein, said alkali-impermeable polymer being hydrolyzable to an alkali-permeable polymer,

b. coating a layer of said dispersion on a support,

c. drying said coated layer, and

d. subjecting said coated layer to a hydrolysis treatment to convert at least a depthwise portion of said layer to said alkali-permeable polymer.

3,928,666

GLASS FIBERS COATED WITH A SIZE CONTAINING STARCH ESTERS OF ISOALKANOIC ACIDS

Albert R. Morrison, Newark; Harold L. Haynes, Granville, and Reuben Hays Bell, Heath, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 29, 1972, Ser. No. 319,414

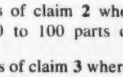
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] B32B *17/02;* **C03C** *25/02*

U.S. Cl. 428—378 **5 Claims**

1. Glass fibers having an aqueous coating thereon consisting essentially of solubilized starch; unctuous material from the group consisting of vegetable waxes, animal waxes, mineral waxes, synthetic waxes, fats and gelled oils; and an effective amount of swollen but unburst starch granules modified by esters of an isoalkanoic acid of from 4 to 6 carbon atoms inclusive, to retain said unctuous material as a lubricant.

5. Glass fibers having a coating thereon consisting essentially of the following solids in percent by weight:

Esterified starch having ester groups of the formula  wherein R is an isoalkyl group of from 3 to 5 carbon atoms	5–90%
Underivatized starch	0–75%
Solid unctuous material	5–40%
Secondary film formers	0–5%
Nonionic oils	0–5%
Cationic lubricants	1–7%
Emulsifying agents	0.5–7%

an effective amount of said esterified starch being present as swollen and unburst starch granules to restrict migration of the unctuous material through the fibers.

3,928,667

AQUEOUS THERMOSET COATINGS UTILIZING TITANIUM CHELATE CURING AGENTS

Donald D. Carlos, Middletown, and Darrell D. Hicks, Jeffersontown, both of Ky., assignors to Celanese Coatings & Specialties Company, Jeffersontown, Ky.

Continuation-in-part of Ser. No. 426,786, Dec. 20, 1973, abandoned. This application Nov. 22, 1974, Ser. No. 525,891

Int. Cl.[2] B05D *7/24;* **C08L** *29/00*

U.S. Cl. 427—385 **7 Claims**

1. A thermosetting coating composition comprising

A. a water soluble or water dispersible polymer of a hydroxyalkyl acrylate or methacrylate wherein the hydroxyalkyl group contains 2 to 4 carbon atoms and wherein the polymer is

1. an inherently water soluble polymer which has a weight average molecular weight of less than 10,000 and which contains 10 to 100% by weight of the hydroxyalkyl acrylate or methacrylate and 90 to 0% by weight of a monomer copolymerizable therewith, said weight percentages being based on the total weight of polymer, or

2. a polymer which has sufficient acid content to be water soluble or water dispersible when salted with an inorganic or organic base, said polymer having an acid value of at least 20 and which contains 10 to 95% by weight of the hydroxyalkyl acrylate or methacrylate, 5

to 25% by weight of a polymerizable ethylenically unsaturated acid or a carboxylic acid containing mercaptan or mixture thereof and 0 to 85% by weight of a monomer copolymerizable therewith, said weight percentages being based on the total weight of polymer;

B. 0.5 to 10% by weight, based on the weight of polymer, of a titanium chelate catalyst; and

C. an aqueous solvent or aqueous dispersant wherein said coatings composition has a total solids content of 25 to 80% by weight.

7. A process for forming a thermoset coating on a substrate which comprises

A. applying to a substrate the coating composition of claim 1; and

B. heating the coating at a temperature of at least 250°F. for a time sufficient to dry the coating and to crosslink it by ester interchange between the ester groups in the polymer.

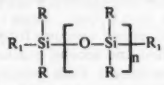
3,928,668
ELECTROSTATIC DEPOSITION OF DRY CERAMIC POWDERS

Jerry D. Snow, Parma, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

Filed May 6, 1974, Ser. No. 467,086
Int. Cl.² B05B *5/02*; **B44D** *1/094*
U.S. Cl. 427—14 **8 Claims**

1. An improved process for forming a ceramic coat on a substrate by electrostatically depositing thereon a ceramic powder having an extended retention time of an electric charge, comprising:

a. coating said ceramic powder with a liquid, curable organopolysiloxane having the formula:



in which R represents monovalent substituents which may be the same or different and are selected from the group consisting of hydrogen, alkyl or cycloalkyl up to 6 carbon atoms, alkenyl or cycloalkenyl up to 6 carbon atoms alkoxy up to 4 carbon atoms, and aryl or arakyl up to 10 carbon atoms, R_1 represents R and and hydroxyl, at least about one-fourth of said R substituents is hydrogen, and n is a whole number within the range from about 5 to about 30,

b. polymerizing the polysiloxane on said powder to a solid state to form a powder having a resistivity of at least about 10^{-12} ohm-cm in an environment having a relative humidity of about 88%,

c. electrostatically depositing the polysiloxane coated ceramic powder substantially uniformly over a portion of said substrate substantially at ambient room temperature,

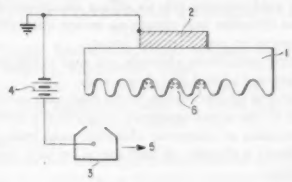
d. subjecting said substrate to physical movement which but for the polysiloxane coating on the ceramic powder would dislodge some of said powder from the substrate, and

e. heating the substrate to fuse the ceramic powder and form thereover a substantially uniform ceramic coat.

3,928,669
IMAGE-FORMING METHOD

Isoji Takahashi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 11, 1973, Ser. No. 423,800
Claims priority, application Japan, Dec. 12, 1972, 47-124563
Int. Cl.² G03G *13/08*, *13/22*
U.S. Cl. 427—19 **12 Claims**



1. An image-forming method, which comprises

positioning a grounded conductive pattern in contact with the back side of an insulating sheet having on the front side a uniform, fine uneven surface of depressions and projections, the depth of said depressions being about 5 to 200 microns,

forming, on said front surface of said insulating sheet, an electrostatic latent image in conformity with said conductive pattern by subjecting said surface to corona discharging,

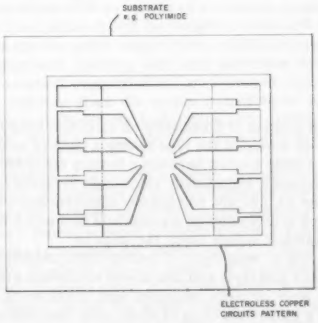
supplying toner particles thereto to deposit said toner particles only in the depressions in said front surface corresponding to the latent image, and

then transferring said deposited toner particles to a receiving material by facing said front surface to said receiving material, said receiving material tending to damage the developed latent image but being prevented from doing so since the toner particles are deposited only in the said depressions.

3,928,670
SELECTIVE PLATING ON NON-METALLIC SURFACES

Charles Roscoe Brummett, Harrisburg, and Ray Ned Shaak, Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 23, 1974, Ser. No. 508,601
Int. Cl.² C23C *3/02*; **H05K** *3/10*
U.S. Cl. 427—53 **7 Claims**



1. A method for the selective electroless deposition of metals upon a substrate comprising the steps of:

a. applying to the said substrate a thin film of a combination of (1) a dye, (2) stannous dichloride and (3) a chelating

agent, said combination having a light absorbance with 3,750 A to 8,000 A wavelength, said dye being selected from the group consisting of methylrosaniline chloride, azure - A, rose bengal, malachite green, eosin, proflavin, proflavin hydrogen chloride, fluoroscein, fluoroscein sodium; erythrosin and mixtures thereof, said chelating agent being selected from the group consisting of orthophenanthroline and ethylenediamine tetraacetic acid;

b. exposing a selected area of the said substrate to which said combination of (1), (2) and (3) has been applied, to light in said wavelength to effect deactivation of said stannous chloride and create an image catalytic to electroless metal in non-exposed areas;

c. depositing palladium chloride on said substrate treated according to (a) and (b) steps; and

d. immersing in an electroless metal bath said substrate with said salt in the areas rendered catalytically active by the active residue of stannous chloride, said bath providing electrolessly a deposit of said metal on said catalytically active sites.

3,928,671

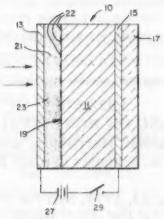
PROCESS FOR FABRICATING A SOLID STATE, THIN FILM FIELD SUSTAINED CONDUCTIVITY DEVICE

Paul F. Robusto, Huntington Beach, and Craig P. Stephens, Oceanside, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Nov. 12, 1973, Ser. No. 415,049

Int. Cl.[2] B05D *5/12*

U.S. Cl. 427—88 **7 Claims**



1. In the process of fabricating an electrical field sustained conductivity device of the type having a layer of heat-treated cadmium sulfide formed between a bottom electrode consisting of an optically transparent, electrically conductive coating disposed on an optically transparent substrate and a top electrode which is deposited on a composite film which is applied to said cadmium sulfide layer, the steps of:

a. applying to said layer of heat-treated cadmium sulfide between said layer and one of said electrodes a discontinuous layer of metal platelets, said metal being selected from a group consisting of silver, gold, and platinum; and

b. co-evaporating onto said metallic layer a second metal and a dielectric so as to form said composite film, said second metal being selected from a group consisting of gold, aluminum, silver, and palladium and said dielectric being silicon monoxide.

3,928,672

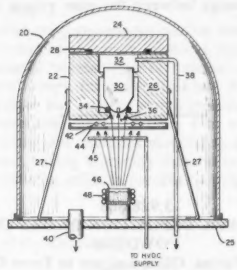
PROCESS FOR PROVIDING A HARD COATING TO MAGNETIC TRANSDUCING HEADS

Thomas R. Appleton, Afton; Richard H. Dean, Bloomington; Edward J. Hillman, Minneapolis; Charles J. Nelson, Rosemount, and Gunter E. Sinn, Inver Grove Heights, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 38,423, May 18, 1970, abandoned. This application Apr. 14, 1972, Ser. No. 244,301

Int. Cl.[2] G11B *21/00*

U.S. Cl. 427—127 **5 Claims**



1. A method of treating a magnetic transducing head to extend the useful life of said head comprising the steps of:

a. cleaning the surface of the transducing head that is to be treated;

b. loading said head in a first evacuable chamber and positioning said first evacuable chamber within a second evacuable chamber for exposing only said surface of said head that is to be treated to said second evacuable chamber;

c. applying first and second vacuums from separate vacuum sources to said first and second evacuable chambers for preventing contaminants from passing from said first evacuable chamber into said second evacuable chamber;

d. generating a silicon monoxide evaporant within said second evacuable chamber but not within said first evacuable chamber; and,

e. directing said evaporant onto said surface of said head that is to be treated to form a deposit of silicon monoxide thereon of a predetermined thickness.

3,928,673

RELEASE AND LUBRICATING COMPOSITION FOR GLASS MOLDS AND METHOD AND APPARATUS UTILIZING SUCH COMPOSITION

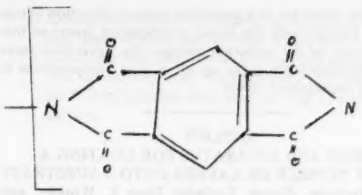
Robert P. Pardee; Thomas J. Loran; Archie L. Bickling, Jr., and Richard E. Brown, all of Boulder, Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

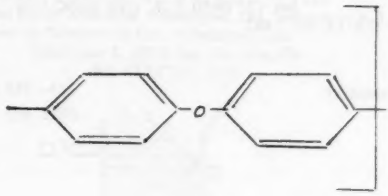
Filed Aug. 16, 1973, Ser. No. 388,847

Int. Cl.[2] B28B *7/36, 7/38*

U.S. Cl. 427—135 **8 Claims**

1. A method of forming a lubricating and release coating on metal surfaces which come into contact with molten glass for forming glass articles, comprising: applying a dispersion of about 10% and 90% by weight based upon the solids a high temperature, polyimide-forming system having a repeating structural unit represented by the formula:





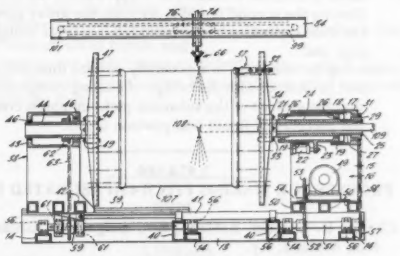
and between about 10% and 90% by weight based upon the solids of graphite having a particle size of about 10 to 200 microns in a liquid carrier to the glass-forming surface and heating for about 0.5 to about 2 hours at between about 105° to 300° F. the surface to remove the carrier and thereafter heating the resulting surface at a temperature about 450° to 700° F., for a period of about several minutes to about 3 hours to form a high temperature, stable polymerized polyimide and admixed graphite coating thereon which is adhered to the glass-forming surface.

3,928,674

METHOD AND APPARATUS FOR PRODUCING ARTICLES OF REINFORCED PLASTICS OR LIKE CONSTRUCTION

Ernst Theodoor Voermans, 9 White St., Clayton, Victoria, Australia

Filed June 12, 1973, Ser. No. 369,136
Int. Cl.² B05B *13/02*, *13/06*; B05C *7/00*
U.S. Cl. 427—171 **18 Claims**



1. A method of producing reinforced tubular and non-tubular articles, of a wide variety of different shapes in a discontinuous manner, comprising the steps of providing a base of flexible material; holding the opposite ends of the base at two longitudinally spaced respective locations and tensioning the base between the locations, with the holding locations constituting the sole support for the base, whereby the base is self-supporting between the locations, coating the base by spraying an initially fluid, hardenable material onto the base, whereby the hardenable material adheres to and coats the base, and rotating the base about an axis during the spray coating thereof.

3,928,675

CRACKLE FINISH COATING OF ARYLENE SULFIDE POLYMER CONTAINING A FLUOROCARBON POLYMER

Dale O. Tieszen, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 299,066, Oct. 19, 1972, Pat. No. 3,857,852. This application Sept. 13, 1974, Ser. No. 505,919
Int. Cl.² B05D *5/00*
U.S. Cl. 427—257 **10 Claims**

1. A process for forming a coated article comprising:

applying to a substrate a dispersion formed by subjecting a poly(arylene sulfide) in particulate form to intensive milling by ball milling or rod milling with a light colored pigment in particulate form capable of withstanding a curing temperature of at least about 300° F; thereafter under less intensive conditions blending the resulting mixture by blade mixing, tumbling, or shaking with a fluorocarbon polymer in particulate form, in the presence of a liquid selected from the group consisting of water, ethylene glycol, propylene glycol, and mixtures thereof; and

heating said thus applied dispersion at a temperature of at least 500°F for at least 5 minutes to obtain a cured coating having a crackle finish.

3,928,676

SYNTHETIC RESIN COMPOSITIONS AND METHODS APPLYING THE SAME TO POROUS MATERIALS TO CONTROL MIGRATION THEREON

Arthur H. Drelich, Plainfield, and George J. Lukacs, Perth Amboy, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 8, 1974, Ser. No. 449,310
Int. Cl.² B05D *7/00*; C08L *1/28*
U.S. Cl. 427—341 **14 Claims**

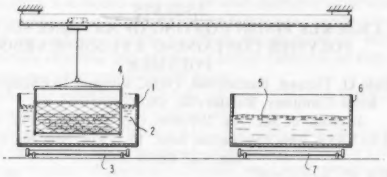
1. Stable, aqueous, colloidal, synthetic resin compositions having an alkaline pH comprising: (1) from about 0.1% by weight to about 60% by weight of a colloidal synthetic resin; and (2) from about 0.01% by weight to about 2% by weight based on the dry solids weight of the colloidal synthetic resin, of an aluminum hydroxy salt, said aluminum hydroxy salt being a reaction product of (a) an aluminum salt; (b) a hydroxide selected from the group consisting of ammonium hydroxide and alkali metal hydroxides; and (c) a high molecular weight, water-soluble, polymeric, poly-carboxy-containing thickening resin.

8. A method of applyiing a stable, aqueous colloidal synthetic resin composition to porous materials and controlling its migration thereon which comprises applying to porous materials a stable, aqueous colloidal synthetic resin composition having an alkaline pH comprising: (1) from about 0.1% by weight to about 60% by weight of a colloidal synthetic resin; and (2) from about 0.01% by weight to about 2% by weight, based on the dry solids weight of the colloidal synthetic resin of an aluminum hydroxy salt of a high molecular weight, water-soluble, polymeric, polycarboxy-containing thickening resin; and substantially immediately diluting the synthetic resin composition to substantially immediately coagulate and precipitate the synthetic resin composition.

3,928,677
PROCESS OF TREATING WOOD

Wilson B. Anthony, Auburn, Ala., assignor to Firewood, Inc., Covington, Ga.

Filed Dec. 8, 1972, Ser. No. 313,527
Int. Cl.² C10L *11/00*; **B05D** *1/00, 3/00, 1/18*
U.S. Cl. 427—374 **10 Claims**

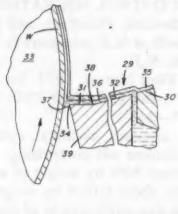


1. A process of treating wood to provide improved burning characteristics comprising immersing a natural wood product in a hydrocarbon bath, heating the bath to a temperature between about 140°C. and 180°C and sufficient to vaporize moisture from the wood and to form pores and passages therein, immediately thereafter cooling the wood product in the presence of hot hydrocarbon, which hydrocarbon provides improved combustion and burning characteristics to the wood, thereby absorbing the hydrocarbon in the pores and passages of the wood product and achieving substantially complete saturation thereof at ambient pressure, and wrapping the cooled wood product in a combustible covering material.

3,928,678
METHOD AND APPARATUS FOR COATING A SUBSTRATE

Brian W. Jackson, Pinner, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1973, Ser. No. 326,621
Int. Cl.² B05D *1/26, 1/34*; **G03C** *1/74*
U.S. Cl. 427—402 **8 Claims**



8. A method of simultaneously coating a plurality of distinct superposed layers of liquid coating compositions onto a web substrate from a coating hopper of the type having a downwardly inclined slide surface, which method comprises the steps of:

simultaneously feeding each liquid coating composition in the form of a layer and in superposed relation to the other composition layers onto the upper portion of the slide surface inclined downwardly at a first predetermined angle with respect to horizontal such that the liquid coating composition layers flow down the surface by gravity; altering the direction of flow of the layers at a lower portion of the slide surface to a second predetermined angle of inclination less than said first angle of inclination so that the liquid composition layers flow more horizontally;

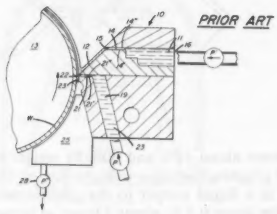
flowing the liquid layers from the lower portion of the slide surface across a generally horizontal gap to a substrate to be coated; and

moving the substrate in a generally upward direction across and in contact with the liquid composition layers so that the surface of the substrate engages the lowermost layer and simultaneously picks up all of said compositions in distinct superposed layers.

3,928,679
METHOD AND APPARATUS FOR COATING A MULTIPLE NUMBER OF LAYERS ONTO A SUBSTRATE

Brian W. Jackson, Pinner, England; Dean E. Winkler, and Charles B. Woodworth, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 26, 1973, Ser. No. 327,048
Int. Cl.² B05D *1/26, 1/34*; **G03C** *1/74*
U.S. Cl. 427—402 **6 Claims**



1. A method of simultaneously coating a plurality of distinct superposed layers of liquid coating compositions onto a substrate from an extrusion-slide coating hopper having both an extruder slot and a downwardly inclined slide surface, which method comprises the steps of:

extruding a first liquid coating composition from an extruder slot across a generally horizontal gap to the substrate;

simultaneously feeding a second liquid coating composition in the form of a layer onto the upper portion of the inclined slide surface so that the second liquid layer flows as a layer by gravity downwardly on the inclined slide surface toward the substrate;

altering the direction of flow of the second layer at a lower lip portion of the slide surface to a direction closer to horizontal than the direction of the upper portion of the slide surface so that the second liquid layer flows in a more horizontal direction as it approaches the substrate; flowing the second liquid layer from the lower portion of the slide surface on to the extruded first layer bridging the gap; and

moving the substrate in a generally upward direction across and in contact with the bridge of coating compositions so that the surface of the substrate picks up and is coated by the plurality of liquid composition layers.

3,928,680
PROCESS FOR MAKING PITCH-IMPREGNATED FIBER PIPE

Charles R. Gannon, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 224,216, Feb. 7, 1972, abandoned. This application Aug. 2, 1972, Ser. No. 277,290
Int. Cl.² B05D *1/18*; **F16L** *9/14*
U.S. Cl. 427—398 **5 Claims**

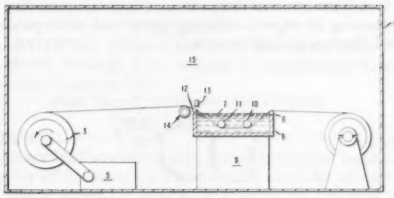
1. A process for manufacturing a pitch-impregnated fiber pipe having a metallic-colored surface comprising;

a. forming a tubular body of interfelted fibrous material;

b. immersing said tubular body of (a) in a liquid impregnant consisting essentially of molten unoxidized petroleum pitch and suspended leafing aluminum pigment of ASTM designation 962–66;

c. forcing said liquid impregnant of (b) into the pore spaces and interstices of said tubular body; and
d. removing said tubular body from said liquid impregnant and quenching said tubular body; thereby forming a pitch impregnated fiber pipe having a metallic-colored surface.

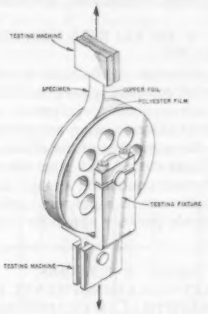
3,928,681
MELT COATING WITH ALKALI METALS
Raymond Daniel Alaburda, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Filed June 5, 1974, Ser. No. 476,535
Int. Cl.² C23C *1/00*
U.S. Cl. 427—431 **7 Claims**



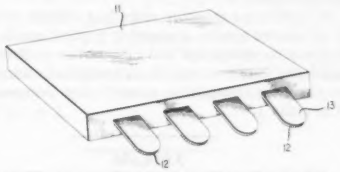
1. A process for coating the surface of a metal sheet with an alkali metal in an inert atmosphere which comprises
A. passing the metal sheet presenting a surface to be coated into a bath of molten alkali metal,
B. rubbing the immersed metal sheet with at least one bar of a metal inert to the alkali metal and at least about as hard as the metal sheet, to wet at least the surface to be coated with the molten alkali metal,
C. withdrawing the metal sheet from the bath bearing a film of molten alkali metal, and
D. cooling the metal sheet to solidify molten alkali metal film thereon within about three seconds after removal from the bath.

3,928,682
METHOD FOR THE SURFACE TREATMENT OF POLYESTER MATERIALS
Julius Hermes, Martinsville, Va., assignor to Martin Processing, Inc., Martinsville, Va.
Continuation-in-part of Ser. No. 192,935, Oct. 27, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 430,084
Int. Cl.² B05D *3/00;* **B32B** *9/04, 27/06*
U.S. Cl. 427—444 **5 Claims**

1. A method for surface-treating a polyester film in order to improve the adherability thereof to other materials comprising subjecting said polyester film to treatment under substantially anhydrous conditions with a solution comprising an alkali metal hydroxide in a relatively high boiling glycol selected from the class consisting of ethylene glycol, propylene glycol, diethylene glycol, dipropylene glycol and tetraethylene glycol.



3,928,683
CORROSION INHIBITOR
Edwin Arthur Chandross, Berkeley Heights, and Valerie Jeanne Kuck, Upper Montclair, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 6, 1974, Ser. No. 467,108
Int. Cl.² B32B *9/04, 9/06*
U.S. Cl. 428—447 **9 Claims**



1. An electrical device having a metal surface to at least a portion of which electrical connections are to be made by soldering, and having a coating on said portion which protects it against surface alteration which would tend to render such soldering more difficult but through which coating soldering can be effected, said coating comprising a polysiloxane having side chain substituents made up of terminal alkyl groups, containing at least **3** carbon atoms, joined by means of amide linkages to alkylene groups, containing not more than **6** carbon atoms, which are in turn bonded to silicon atoms of the siloxane.

3,928,684
STRENGTH CHARACTERISTICS OF GLASS FIBER REINFORCED VINYL CHLORIDE THERMOPLASTICS AND CHLORINATION PRODUCTS THEREOF

Robert Buning, Troisdorf-Sieglar; Peter Loebler, Troisdorf, and Werner Trautvetter, Troisdorf-Spich, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed May 24, 1973, Ser. No. 363,769

Claims priority, application Germany, June 7, 1972, 2227650

Int. Cl.² B32B *5/22, 17/06*

U.S. Cl. 428—297 **19 Claims**

1. Polyvinylchloride or chlorinated polyvinylchloride polymer article reinforced with glass fibers coated with vinyl chloride-vinyl trialkoxysilane copolymers containing a major amount of vinyl chloride in an amount effective to increase the strength characteristics of the article.

16. Glass fibers coated with vinyl chloride - vinyl trialkoxysilane copolymers containing a major amount of vinyl chloride, suitable for use in a polyvinyl chloride or chlorinated polyvinyl chloride polymer article for reinforcing said article.

3,928,685
1-HYDROXY-1-(4-AMINOPHENYL POLYMETHINE) NAPHTHALAN COMPOUNDS AND PRESSURE-SENSITIVE RECORDING SYSTEM THEREWITH

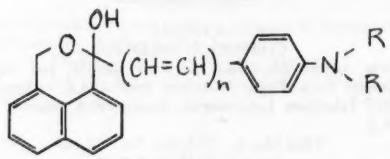
Derek J. Alsop, North Tonawanda, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Nov. 21, 1974, Ser. No. 525,990

Int. Cl.² C07D *311/92;* **C08K** *5/15*

U.S. Cl. 428—411 **10 Claims**

1. A 1-hydroxy-1-(4-aminophenyl polymethine) naphthalan compound having the following structural formula:



wherein each R represents either a hydrogen atom or a lower alkyl group having from 1 to 5 carbon atoms and wherein *n* is an integer from 1 to 3.

7. In a pressure-sensitive recording system comprising a layer of microcapsules containing a substantially colorless color precursor compound and a layer of an electron-acceptor material, the improvement which comprises utilizing, as said color precursor compound, a naphthalan compound as set forth in claim **1**.

3,928,686
HEAT-SENSITIVE RECORDING MATERIALS

Albert Lucien Poot; Frans Clement Heugebaert, both of Kontich; Wilhelmus Janssens, Aarschot, and Antoon Leon Vandenberghe, Hove, all of Belgium, assignors to Agfa-Gevaert N.V., Mortsel, Belgium

Filed Feb. 26, 1973, Ser. No. 335,670

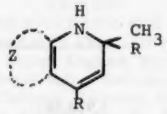
Claims priority, application United Kingdom, Feb. 28, 1972, 9141/72

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² B41M *5/18*

U.S. Cl. 428—457 **15 Claims**

1. A recording process comprising the step of applying a heat pattern corresponding to an image to a recording material containing a silver compound that is generally non-light sensitive at a temperature below about 200°C and is adapted to undergo chemical reduction to release silver metal, while said silver compound is in reactive contact with an organic reducing compound corresponding to the following general formula:



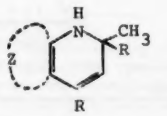
in which:

R represents a C_1–C_4 alkyl group, and

Z represents the necessary atoms to close a benzene, naphthalene, anthracene, carbazole, indole, benzo furan, dibenzofuran, phenothiazine, fluorene, indene, xanthene, or quinolin-2-one nucleus,

whereby said silver compound is reduced in the heated regions of said material to silver metal and forms a visible image of said pattern.

9. A sheet material comprising at least one recording layer containing an organic reducing compound corresponding to the following general formula:



in which:

R represents a C_1–C_4 alkyl group, and

Z represents the necessary atoms to close a benzene, naphthalene, anthracene, carbazole, indole, benzo furan, dibenzofuran, phenothiazine, fluorene, indene, xanthene, or quinolin-2-one nucleus,

and having in said layer or in a contacting layer a silver compound reducible by said organic reducing compound to silver metal under the influence of heat, said silver compound being generally non-light sensitive at a temperature below about 200°C.

3,928,687
PROCESS FOR THE PRODUCTION OF MODIFIED POLYPROPYLENES

Shozo Wada, Zushi; Makoto Yoda, and Takashi Uchiyama, both of Oi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 14, 1972, Ser. No. 234,640

Claims priority, application Japan, Mar. 16, 1971, 46-14066

Int. Cl.² C08K *7/14;* **C08L** *23/26*

U.S. Cl. 428—461 **9 Claims**

1. A process for the production of a modified polypropylene, which comprises heating a crystalline polypropylene with at least one member selected from the group consisting of cis-4-cyclohexene-1,2-dicarboxylic acid, endo-bicyclo[2,2,1]-5-heptene-2,3-dicarboxylic acid, methyl-endo-bicyclo[2,2,1]-5-heptene 2,3-dicarboxylic acids and their anhydrides in the presence of a free radical producing agent.

3,928,688
PRINTING FIBROUS MATERIAL

Karl Dachs, Frankenthal; Gerhard Faulhaber, Mannheim; Rolf Fikentscher, Ludwigshafen; Knut Oppenlaender, Ludwigshafen, and Joachim Schulze, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 2, 1972, Ser. No. 259,274

Claims priority, application Germany, June 11, 1971, 2128904

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.[2] D06P *1/00*

U.S. Cl. 428—515 **5 Claims**

1. In a process for printing fibrous material wherein a print paste consisting essentially of an oil-in-water emulsion of a pigment, a thickening agent, a pigment binder and emulsifier of the oxyalkylated phenol derivative type is applied to said fibrous material, the improvement which comprises the use as said emulsifier from 0.1 to 1.5% by weight based on the finished print paste of di-(α-phenylethyl)-phenol which has been oxyethylated from 12 to 16 times.

3,928,689
ARTIFICIAL TREE WITH HINGED BRANCHES

Alan Mottel, Yonkers, N.Y., assignor to Consolidated Novelty Co., Inc., Paterson, N.J.

Filed Nov. 7, 1974, Ser. No. 521,935

Int. Cl.[2] A47G *33/08*

U.S. Cl. 428—9 **1 Claim**

1. An artificial tree including a central cylindrical trunk and a number of branches circumferentially disposed about the trunk, hinge means for joining the branches to the trunk for movement about generally horizontal axes between vertically erect positions and outstretched, up-swept positions, the hinge means including a retaining sleeve fixed to the trunk, elongated tubular, hollow branch receivers for receiving the interior end of a branch, the hinge means further including pairs of parallel tabs circumferentially spaced about the retaining sleeve, the interior portion of each branch receiver being situated between a pair of tabs, pivot means for rotatably mounting the branch receivers on the retaining member, the pivot means including a pin passing through each pair of tabs and through the interior portion of the branch receiver, and providing axes of rotation passing through the branch receivers, the axes being offset interiorly from the centerlines of the branch receivers so the branch receivers with their branches will tend to rotate by the force of gravity from the erect positions to the up-swept positions, and stop means for limiting the outward movement of the branches as they reach their upswept positions, said stop means comprising the interior faces of the tubular, hollow branch receivers being in alignment with and coming into contact substantially along a line described by a closed figure, with the exterior of the cylindrical central trunk.

3,928,690
RELEASE COATED ADHESIVE TAPE

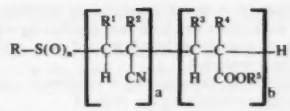
Robert A. Settineri, Telford, Pa., and John T. O'Brien, Cheshire, Conn., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Dec. 30, 1974, Ser. No. 537,625

Int. Cl.[2] C07C *121/00*; **B32B** *7/10*

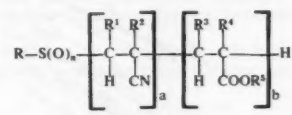
U.S. Cl. 428—40 **29 Claims**

1. A pressure sensitive adhesive tape comprising a flexible backing which has a pressure sensitive adhesive on one side and a release coating on the other side, said release coating consisting essentially of an oligomer represented by the formula



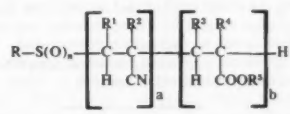
wherein R is a linear or branched alkyl radical having 12 to 22 carbon atoms; R^1 and R^2 may be the same or different and are hydrogen, a $-CH_3$ or $-C_2H_5$ group; R^3 is hydrogen, a $-CH_3$, $-C_2H_5$ or $-COOR^5$ group; R^4 is hydrogen, a $-CH_3$, $-C_2H_5$, $-COOR^5$ or $-CH_2COOR^5$ group provided R^3 is other than $-COOR^5$ if R^4 is $-COOR^5$ or $-CH_2COOR^5$; R^5 is hydrogen or a cation based on an alkali metal, ammonia or an amine; $(a+b)$ is from 4 to 100; $a/(a+b)$ is from 0.0 to 0.6; and n has a value of 0,1 or 2.

10. A flexible backing for pressure sensitive adhesive tape having on at least one side a release coating consisting essentially of an oligomer having a structural formula



wherein R is a linear or branched alkyl radical having 12 to 22 carbon atoms; R^1 and R^2 may be the same or different and are hydrogen, a $-CH_3$ or $-C_2H_5$ group; R^3 is hydrogen, a $-CH_3$, $-C_2H_5$ or $-COOR^5$ groups; R^4 is hydrogen, a $-CH_3$, $-C_2H_5$, $-COOR^5$ or $-CH_2COOR^5$ group, provided R^3 is other than $-COOR^5$ if R^4 is $-COOR^5$ or $-CH_2COOR^5$; R^5 is hydrogen or a cation based on an alkali metal, ammonia or an amine; $(a+b)$ is from 4 to 100; $a/(a+b)$ is from 0.0 to 0.6; and n has a value of 0, 1 or 2.

26. A strucutre comprising an adhesive engaged with a release coating, said release coating consisting essentially of an oligomer represented by the formula



wherein R is a linear or branched alkyl radical having 12 to 22 carbon atoms; R^1 and R^2 may be the same of different and are hydrogen, a $-CH_3$ or $-C_2H_5$ group; R^3 is hydrogen, a $-CH_3$, $-C_2H_5$ or $-COOR^5$ group; R^4 is hydrogen, a $-CH_3$, $-C_2H_5$, $-COOR^5$ or $-CH_2COOR^5$ group, provided R^3 is other than $-COOR^5$ if R^4 is $-COOR^5$ or $-CH_2COOR^5$; R^5 is hydrogen or a cation based on an alkali metal, ammonia or an amine; $(a+b)$ is from 4 to 100; $a/(a+b)$ is from 0.0 to 0.6; and n has a value of 0,1 or 2.

3,928,691
REINFORCED PANELS AND METHOD OF CONSTRUCTING SAME

Richard A. Knudson, P.O. Box 1393, Torrance, Calif. 90505

Filed June 17, 1974, Ser. No. 480,282

Int. Cl.[2] B32B *3/10*, *3/02*, *31/04*; **B63B** *3/06*

U.S. Cl. 428—53 **8 Claims**

1. A reinforced panel, comprising:

a reinforcing rod;

a plurality of core members each having edge portions provided with semi-cylindrical grooves generally conforming to the shape of semi-cylindrical portions of said reinforcing rod, pairs of said core members encompassing and in essentially contiguous contact with said reinforcing rod and having their edge portions sealed and bonded

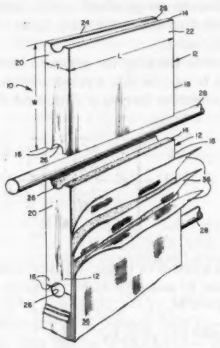
together by a sealant material in abutting relationship with each other and with said reinforcing rod; and

a sheet of material adhered to said core members by an adherent material.

8. A method of constructing a reinforced panel having a curved surface comprising the steps of:

providing a mold defining said curved surface, said mold having a lower edge and an upper edge;

placing a first core member along said lower edge of said mold, said first core member having an upper edge provided with a semi-cylindrical groove generally conforming to the shape of a reinforcing rod extending the full length of said first core member;



placing a first reinforcing rod in said groove on said first core member;

covering said rod and said upper edge of said first core member with an adhesive;

procuring a second core member having upper and lower edges both provided with semi-cylindrical grooves matching the groove in said first core member in size and shape; sealing the lower edge of said second core member to the upper edge of said first core member and bonding said reinforcing rod to said core members; and

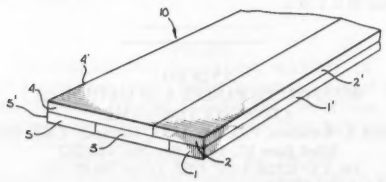
adding additional reinforcing rods and core members in like manner until said mold is covered.

3,928,692

COMPOSITE PLATING TAPE

Peter P. Pellegrino, 2762 Shields Court, Thousand Oaks, Calif. 91360

Filed May 2, 1973, Ser. No. 356,481
Int. Cl.² B32B *3/16*
U.S. Cl. 428—54 **10 Claims**



1. A composite plating tape comprised of a tape configured in at least two layers, each of said layers being comprised of a plurality of sections of adhesive tape, said sections of tape being held in stable spatial relation with respect to one another by the adhesiveness of the adjoining surfaces of said sections of tape, the line of engagement between each pair of said adjacent sections of tape being located within the surface area of at least one other of said sections of tape which is disposed in an immediately adjacent layer thereof, whereby the adhesion between the surfaces of said pair of adjacent sections and said other section of tape keeps said adjacent sections of tape from disengaging, said sections of tape comprising each layer thereof being disposed adjacent to and in adhesion with one another in a direction transverse to their longitudinal direction, whereby the sequential removal of some of said sections of tape provides, sequentially, appropriately spaced tape sections required as barriers in a process for stripping a first metal from a surface and for replating said surface with said second metal.

3,928,693

COMPOSITE ARTICLE OF FIBERS AND RESINS

Bernard Rudloff, Marckolsheim (Bas-Rhin), France

Division of Ser. No. 87,605, Nov. 6, 1970. This application Sept. 19, 1973, Ser. No. 398,766
Int. Cl.² B32B *1/04, 3/02*
U.S. Cl. 428—74 **1 Claim**

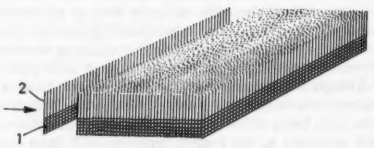
1. A composite article comprising at least one layer of fibers permeated by a mixture of a rosin with a curing temperature in a range of about 60° to 100°C and a phenol-formaldehyde polymer whose melting point under a pressure of about 400 to 600 kg/cm² is in a range of about 110° to 200°C, said layer being encased in said polymer.

3,928,694

PILE CARPET AND A PROCESS FOR ITS MANUFACTURE

Ruedi Reinhard, Guger, 4917 Melchnau (Berne), Switzerland

Filed Mar. 16, 1973, Ser. No. 342,084
Claims priority, application Switzerland, Mar. 23, 1972, 4350/72
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² D03D *27/00;* **D04H** *11/00*
U.S. Cl. 428—92 **6 Claims**



1. A pile carpet having a pile perpendicular to a base and including textile yarn wherein the base comprises woven fabric strips abutting each other by their lateral areas and being connected to one another, said strips standing upright on edge on one of their edges, and wherein the pile comprises free, unbound ends of said yarn running perpendicularly to said base in said fabric strips, said free ends projecting beyond the other edges of said fabric strips.

4. A process for manufacturing a pile carpet having a pile layer perpendicular to a base and including textile yarn and in which the base comprises woven fabric strips abutting each other by their lateral areas and being connected to one another, said strips standing upright on edge on one of their edges, and wherein the pile layer comprises free, unbound ends of said yarn running perpendicularly to said base in said fabric strips, said free ends projecting beyond the other edges of said fabric strips, comprising the steps of cutting a fabric web, having warp threads in groups so spaced that the weft threads float between said warp thread groups, in the warp direction into strips including a part of woven fabric and a part of unbound free ends of weft threads extending over each strip's entire length, placing said strips upright on edge, and bonding the lateral areas of the woven parts of said strips so

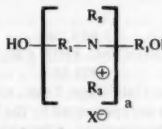
that the woven parts will result in the base and the free ends of weft threads in the pile of the carpet.

3,928,695
ODORLESS ELECTROCONDUCTIVE LATEX COMPOSITION

Dennis H. Philp, and Norman L. Madison, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 28, 1974, Ser. No. 484,042
Int. Cl.² B21B *3/02;* **B32B** *33/00, 7/00*
U.S. Cl. 428—95 **15 Claims**

1. An electroconductive latex composition comprising an anionically-stabilized latex and a hydroxyalkyl quaternary ammonium salt represented by the formula:



wherein R_1 is alkylene having from 1 to 6 carbon atoms, R_2 is alkyl having 1 to 6 carbon atoms or $(C_nH_{2n}O)_yH$ where y is 1 to 4 and n is an integer from 1 to 4, R_3 is alkyl having 1 to 6 carbon atoms or $(C_nH_{2n}O)_yH$ where y is 1 to 4 and n is an integer from 1 to 4, a is an integer from 1 to 15, and X is an anion, said ammonium salt being present in an amount sufficient to measurably reduce the volume resistivity of said composition.

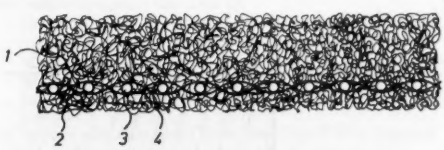
11. The composition of claim 1 wherein the composition is applied as a backing to a textile fabric.

12. The composition of claim 1 wherein the composition is applied as a backing to carpet.

3,928,696
STITCHED WEBS OF FLEECES OF SYNTHETIC FIBERS AND METHOD OF MAKING SAME

Martin Wandel; Manfred Salamon, both of Dormagen; Götz Gotmar Dornheim, Leichlingen, and Bernard Kuhlmann, Rheydt, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Sept. 7, 1972, Ser. No. 286,913
Claims priority, application Germany, Sept. 7, 1971, 7133997
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B32B *7/08, 27/02, 3/28;* **E02B** *3/12*
U.S. Cl. 428—102 **10 Claims**



1. An erosion preventing structural element in the form of a stitched web of fleece of coarse, crimped fibres, consisting of a web of fleece produced from

a. crimped polyamide fibres of dtex 5 to 250 and staple length 20 to 150 mm stitched with 60 to 180 stitches per cm^2,

b. a mesh fabric of synthetic endless yarns stitched into the fleece, the fabric having at least 2 warp yarns and 2 weft yarns per cm^2 and being arranged in the lower third of the web of fleece, and

c. a waterproof binder based on polyacrylic acid ester of at least 15% by weight, this web of fleece having a thickness of 4 to 10 mm and a weight per m^2 of between 500 and 2000 g.

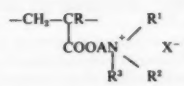
3. A process for the production of erosion preventing structural elements in the form of webs of stitched fleeces of synthetic fibres, which comprises laying crimped polyamide staple fibres of dtex 5 to 250 to form a fleece, stitching together the formed fleece and a mesh fabric, impregnating the resultant combination with a waterproof binder based on polyacrylate and subjecting the impregnated fleece to a heat treatment at temperatures of between 100° and 150°C.

3,928,697
COATED FILMS

William John Mallinson, Colchester; Roy Frederick Huffey, Ipswich, and Geoffrey Pickles Irvin, Brantham, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 25, 1974, Ser. No. 526,925
Claims priority, application United Kingdom, Dec. 6, 1973, 56626/73
Int. Cl.² B32B *1/00, 3/00*
U.S. Cl. 428—142 **14 Claims**

1. An anti-static matt coated plastics film which comprises a self-supporting synthetic plastics film base having superimposed on at least one surface of the film base an adherent matt layer comprising a finely divided particulate material and a resinous binder, wherein the coated film has at least one coating layer comprising an anti-static material, said anti-static material comprising a polymer or copolymer containing repeating units of the formula:



wherein R represents hydrogen or methyl, R^1 represents methyl or ethyl, R^2 and R^3 each independently represent methyl or ethyl or R^2 and R^3 taken together represent $-CH_2CH_2OCH_2CH_2-$ or $-(CH_2)_n-$ where n represents 4, 5 or 6, A represents an alkylene or substituted alkylene group and X^- represents an anion, said polymer or copolymer having an average molecular weight in the range 5,000 to 2,000,000.

4. An anti-static film according to claim **1**, in which an intermediate adhesion-promoting layer is disposed between the plastics film base and the matt layer, the anti-static material being included in the intermediate adhesion-promoting layer in an amount in the range from 0.2 to 2.0 mg/dm^2.

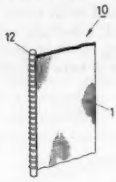
3,928,698
STRINGER TAPE FOR SLIDING CLASP FASTENERS

Yoshiharu Yamaguchi, No. 1482 Hongo, Uozu, Toyama, and Shinya Kawanabe, No. 4001, Mikka-ichi, Kurobe, Toyama, both of Japan

Filed Mar. 25, 1971, Ser. No. 127,929
Claims priority, application Japan, Mar. 31, 1970, 45-27725; Mar. 31, 1970, 45-27726
Int. Cl.² B32B *3/10;* **A44B** *19/00;* **D03D** *3/00*
U.S. Cl. 428—172 **3 Claims**

1. A stringer tape for sliding clasp fasteners, comprising a tape web portion and a cord formed separately from the tape web and secured to a longitudinal edge thereof to form therealong a flange for mounting fastener elements, said cord hav-

ing a central, longitudinally extending reinforcing core and a multiplicity of longitudinally extending fibers bonded together



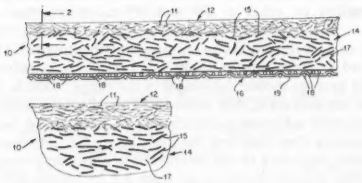
and to said core by an adhesive that is separate from said fibers and core and occupies interstitial spaces thereamong.

3,928,699

PAPERMAKERS FELTS

Eugene Zoltan Fekete, East Greenbush, N.Y., assignor to Huyck Corporation, Wake Forest, N.C.

Filed Aug. 8, 1973, Ser. No. 386,636
Int. Cl.[2] D03D *3/00*; B22C *9/08*
U.S. Cl. 428—212 **19 Claims**



1. A papermakers felt comprising

a fibrous surface layer and a fibrous underlayer characterized by the fact that

the surface layer comprises randomly arrayed fibers, the preponderance of which are 27 microns or less in diameter, and

the underlayer comprises randomly arrayed fibers a preponderance of which are substantially rigid and substantially nondeformable cross-sectionally, and the diameter of which are at least 1.75 times greater than the diameter of the fibers which comprise said surface layer; said fibrous surface layer being less than one-third the thickness of the entire felt in the uncompressed state.

13. A method of making a papermakers felt comprising the steps of forming a fibrous surface layer which comprises fibers the preponderance of which are 27 microns or less in diameter, said fibrous layer being less than one-third the thickness of the entire felt in the compressed state,

forming an underlayer from a material which comprises randomly arrayed fibers, the preponderance of which are substantially rigid, substantially nondeformable, cross-sectionally and at least **1.75** times greater in diameter than the fibers of said surface layer, and

affixing said surface layer and said underlayer to each other.

3,928,700

METHOD OF PRODUCING THIN CELLULOSE NITRATE FILM

Sebastian B. Lupica, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 30, 1974, Ser. No. 474,554
Int. Cl.[2] B32B *7/02*; C08L *1/18*; G01T *1/02*
U.S. Cl. 428—220 **1 Claim**

1. A cellulose nitrate film 10 to 20 microns in thickness, uniformly thick within ±0.5 micron, said film formed by a method which comprises forming a solution of cellulose nitrate containing 10–13 percent by weight nitrogen in tetrahydrofuran, said solution containing 7–15 percent by weight dioctyl phthalate based on the weight of cellulose nitrate, evaporating said solution on a flat surface, drying the resultant film, removing said film from said surface, and then annealing said film to remove residual solvent.

3,928,701

HELIX OF A SERIES OF DISCARDED VEHICLE TIRES

Soll Roehner, P. O. Box 428, Pompano Beach, Fla. 33061

Filed July 16, 1974, Ser. No. 488,959
Int. Cl.[2] B63B *59/02*; B60R *19/00*; B61F *19/04*
U.S. Cl. 428—222 **22 Claims**

1. An article of manufacture, comprising: a structure including a series of connected vehicle tire loops, said loops being generally tubular in form, and means connecting the end of one loop with the end of another loop in end-to-end relation.

3,928,702

PROCESS FOR MANUFACTURING AN ACTIVATED CLAY-COATED PAPER FOR USE AS A PRESSURE-SENSITIVE COPYING PAPER

Hiroharu Matsukawa, and Takao Hayashi, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 209,462, Dec. 17, 1971, abandoned, which is a continuation of Ser. No. 858,525, Sept. 16, 1969, abandoned. This application Mar. 25, 1974, Ser. No. 454,497

Claims priority, application Japan, Sept. 16, 1968, 43-66818

Int. Cl.² B41C *1/06*; B41M *5/16*

U.S. Cl. 428—323 12 Claims

1. In a process for producing color on a support having coated thereon a layer of an electron accepting clay material capable of forming a distinct color when contacted with a colorless, electron donating color former wherein a layer of electron accepting clay material is applied to said support and thereafter said electron accepting clay is contacted with a colorless, electron donating color former, the improvement which comprises adding a hydrophobic oily material as an oil in water emulsion to a water dispersion of said clay and then coating the obtained water dispersible emulsion and said clay onto the support and drying the clay coated support, the amount of said hydrophobic oily material to the clay ranging from 1:50 to 1:2 parts by weight.

10. A pressure-sensitive copying paper comprising a layer of microcapsules containing a color former and a layer of an electron-accepting clay material capable of forming a distinct color when contacted with the color former, said layers coated on the same or different support, and said layer of electron-accepting clay material containing a binder and a hydrophobic oily material, the amount of said hydrophobic oily material to the clay ranging from 1:50 to 1:2 parts by weight.

3,928,703

PROCESS FOR COATING A SUBSTRATE WITH A FLUORINATED ORGANIC POLYMER AND PRODUCT THEREOF

John Ransom Cook, Riegelsville, Pa., assignor to Chemical Fabrics Corporation, Bennington, Vt.

Continuation-in-part of Ser. No. 255,995, May 23, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,064

Int. Cl.² B05D *5/00*; D06M *15/32*

U.S. Cl. 428—255 14 Claims

1. A method for coating a substrate selected from the group consisting essentially of woven and non-woven fiberglass, asbestos, and wire cloth with a fluorinated organic polymer, wherein the substrate contains openings as large as about 12 mils, which comprises the steps of:

a. preparing a liquid suspensoid containing the fluorinated organic polymer and spherical beads, the major portion of which have a maximum diameter of 25 microns or less and which are capable of being suspended in the suspensoid and will withstand the fusion temperature of the polymer;

b. applying the suspensoid to the substrate to form a coated substrate material;

c. evaporating the suspensoid liquid medium; and

d. heating the coated substrate to at least the fusion temperature of the polymer to form a dried non-porous coated product.

10. A smooth, non-porous product comprising a substrate selected from the group consisting essentially of woven and non-woven fiberglass, asbestos, and wire cloth having a coating which comprises a fluorinated organic polymer and spherical beads, the major portion of which have a maximum diameter of 25 microns or less and which can withstand the fusion temperature of the polymer, said substrate having openings in its structure as large as about 12 mils.

3,928,704

METHOD FOR PRODUCING THIN-WALLED ARTICLES FROM PLASTICS

Viktor Heidingsfeld; Slavko Hudeček; Jaroslav Hnídek; Jan Kolařík, and Jiri Zelinger, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 302,898, Nov. 1, 1972, Pat. No. 3,875,261. This application June 24, 1974, Ser. No. 482,641

Claims priority, application Czechoslovakia, Nov. 5, 1971, PV7797-71

Int. Cl.² B32B *7/00*; D04H *3/12*, *13/00*

U.S. Cl. 428—260 12 Claims

1. A thin-walled plastic article comprising a uniform blend of an admixture of at least one hydrophilic filler based on a synthetic cross-linked water-insoluble macro-molecular compound containing polar groups capable of binding water reversibly, at least one liquid boiling in the range of 60° to 140°C and effective to swell said hydrophilic filler selected from the group of water and lower aliphatic alcohols, and a vinyl chloride plastisol type resin material selected from the group of polyvinylchloride, copolymers of vinyl chlorid and mixtures thereof, said liquid being in an amount of at least 10% by weight referred to the hydrophilic filler, said blend being formed into an expanded jell and set into a predetermined shape.

3,928,705

DIELECTRIC INSULATION EMPLOYING OPEN-CELLED MICROPOROUS FILM

John T. Loft, Springfield, N.J., and John A. McTaggart, Erie, Pa., and Steven G. Plovan, Livingston, N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 134,423, April 15, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 331,843

Int. Cl.² B44D *1/18*, *1/44*

U.S. Cl. 428—311 4 Claims

1. An electrical conductor having a dielectric insulation layer for retarding the discharge of electrical charges comprising a partially heat-shrunk open-celled microporous film comprised of a polymer selected from polyolefins, polyacetals, polyamides, polyesters, polyalkylene sulfides and polyarylene oxides having a reduced bulk density as compared to the bulk density of the corresponding polymer films having no open-celled structure, a crystallinity of above about 20 pecent, a pore size of about 100 to 12,000 Angstroms, a pre-impregnation nitrogen flux of about 5–400, and an elastic recovery at 50 percent extension of greater than 40% and said polymer film impregnated with a dielectric liquid selected from a halogenated organic compound having from 1 to 5 halogen substituents and from 1 to 3 aryl groups; perfluorobutylamines and ethers; perfluorohydrocarbons; silicone oils; mineral oils; castor oil; and cottonseed oil, said dielectric liquid being in contact with said electrical conductor.

3. A method for retarding the discharge of electrical charges which comprises placing a partially heat-shrunk open-celled microporous polymer film in contact with an electrical conductor to insulate said electrical conductor, said polymer film comprising a polymer selected from polyolefins, polyacetals, polyamides, polyesters, polyalkylene sulfides and polyarylene oxides having a reduced bulk density as compared to the bulk density of the corresponding polymer films having no open-celled structure, a crystallinity of above about 20 percent, a pore size of about 100 to 12,000 Angstroms, a pre-impregnation nitrogen flux of about 5–400, and an elastic recovery at 50 percent extension of greater than 40% and said polymer film impregnated with a dielectric liquid selected from a halogenated organic compound having from 1 to 5 halogen substituents and from 1 to 3 aryl groups; perfluorobutylamines and ethers; perfluorohydrocarbons; silicone oils; mineral oils; castor oil and cottonseed oil, said dielectric liquid being in contact with said electrical conductor.

3,928,706

WEAR-RESISTANT DECORATIVE LAMINATES AND METHODS FOR PRODUCING SAME

Harold Gibbons, Wokingham, England, assignor to Formica International Limited, London, England

Filed June 25, 1973, Ser. No. 373,308

Int. Cl.² B32B *5/16;* **B44F** *1/00*

U.S. Cl. 428—323 **13 Claims**

1. A wear-resistant decorative plastics laminate, being the consolidated cured unitary structure obtained by the application of heat and pressure to a superimposed assembly consisting essentially of, in this order, (1) a core of thermosetting resin-impregnated fibrous sheets, (2) a coloured or printed decorative fibrous sheet impregnated with a thermosetting resin, (3) a wear-resistant layer consisting essentially of a thermosetting resin composition, a finely divided water-insoluble mineral matter having a hardness of at least 7 on the Moh's scale of hardness and a finely divided fibrous cellulosic material and (4), as an outermost lamina, an overlay sheet consisting essentially of an alpha-cellulose paper impregnated with a thermosettable resin.

3,928,707

PAPER COATING LUBRICANTS AND COATED PAPER INCORPORATING SUCH

George E. Lauterbach, Naperville, and Marla S. Crill, Lisle, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 6, 1974, Ser. No. 521,391

Int. Cl.² B32B *9/06, 27/10*

U.S. Cl. 428—342 **12 Claims**

1. A coated paper comprising

a. a cellulosic, non-woven paper sheet member, and

b. a coating integral with at least one of the two opposed faces of said paper sheet member,

c. said coating comprising from about 1.4 to 17 grams per square meter relative to said paper sheet member,

d. said coating being further comprised of coating binder, particulate pigment, and at least one monohydric aliphatic alcohol containing from 16 through 30 carbon atoms per molecule, the weight ratio of said coating binder to said particulate pigment ranging from about 8:100 to 50:100, and the weight ratio of said alcohol to said particulate pigment ranging from about 0.2:100 to 3:100.

5. A coated paper comprising

a. a cellulosic, non-woven paper sheet member, and

b. a coating integral with at least one of the two opposed faces of said paper sheet member,

c. said coating comprising from about 1.4 to 17 grams per square meter relative to said paper sheet member,

d. said coating being further comprised of coating binder, particulate pigment and a lubricant composition, the weight ratio of said coating binder to said particulate pigment ranging from about 8:100 to 50:100, and the weight ratio of said lubricant composition to said particulate pigment ranging from about 0.2:100 to 3:100,

e. said lubricant composition comprising from about 1 to 85 weight percent of at leasat one paraffinic hydrocarbon containing from 16 through 30 carbon atoms per molecule with the balance up to 100 weight percent thereof being at least one monohydric aliphatic alcohol containing from 16 through 30 carbon atoms per molecule.

3,928,708

TRANSPARENT FIRE RESISTANT POLYMERIC STRUCTURES

George M. Fohlen, Millbrae; John A. Parker, Los Altos, and Paul M. Sawko, San Jose, all of Calif., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Jan. 29, 1974, Ser. No. 437,556

Int. Cl.² B32B *27/36, 27/38*

U.S. Cl. 428—412 **10 Claims**

1. A transparent heat-, fire- and impact-resistant laminate structure comprising:

1. a heat resistant layer of an epoxy resin cured to a hard solid with an alkoxy boroxine catalyst,

2. a layer of high impact strength aromatic polycarbonate resin selected from a polybisphenol A carbonate resin or a polyphenolphthalein carbonate resin, and

3. intermediate said layers, a transparent adhesive elastomeric interlayer.

8. The structure of claim **1**, wherein the laminate structure is coated with a thin transparent polymeric abrasion resistant material.

3,928,709

FERROUS FERRIC OXIDES, PROCESS FOR PREPARING SAME AND THEIR USE IN MAGNETIC RECORDING

Roger G. L. Audran, Vitry-Sur-Seine, and Bernard J. Pinguad, Vincennes, both of France, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 230,915, March 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 74,533, Sept. 22, 1970, abandoned. This application Sept. 7, 1973, Ser. No. 395,220

Claims priority, application France, Sept. 13, 1972, 72.32367

Int. Cl.² C09G *49/08*

U.S. Cl. 428—539 **22 Claims**

1. Acicular ferrous ferric oxide consisting essentially of acicular crystals that have an acicularity ratio of at least 15, a coeffecient of polydispersion above 2, and which comprise alkali metal ions which impart a basicity of at least 0.04 meq. per gram to said oxide.

4. Acicular ferrous ferric oxide according to claim **3** in which said alkali metal ions are sodium or potassium ions, said basicity is in the range of 0.04 to about 0.2 meq. per gram of oxide and said alkaline earth metal ions are calcium ions.

16. A process for preparing acicular ferrous ferric oxide crystals for magnetic recording which comprises

adding under non-oxidizing conditions, at a temperature below about 60°C, an aqueous solution of ferrous salt to an aqueous solution of a stoichiometric excess of an alkaline hydroxide while substantially avoiding local excesses of said ferrous salt, to form an aqueous dispersion of ferrous hydroxide particles, said alkaline hydroxide being present in said aqueous dispersion in a concentration of at least a 500% stoichiometric excess;

introducing oxygen into said dispersion at a temperature of about 20° to about 60°C for a period of time sufficient to convert said ferrous hydroxide particles to crystals of alpha ferric oxide hydrate, the concentration of ferrous salt in said aqueous solution being such that the concentration of said alpha ferric oxide hydrate formed in said dispersion is less than about 15 grams per liter;

discontinuing introduction of said oxygen into said dispersion;

boiling said dispersion to obtain further crystallization of said alpha ferric oxide hydrate crystals;

dehydrating said alpha ferric oxide hydrate crystals to form alpha ferric oxide;

reducing said alpha ferric oxide to form ferrous ferric oxide and recovering said ferrous ferric oxide.

3,928,710

HEAT ACTIVATED TRANSFERS

Raymond Mills Arnold, Biddenden; Eric Henry Francis Neaves, Lympe, and Leslie John Phillips, Ashford, all of England, assignors to Letraset International Limited, London, England

Continuation-in-part of Ser. No. 134,445, April 15, 1971, abandoned. This application July 10, 1973, Ser. No. 378,237

Claims priority, application United Kingdom, Apr. 29, 1970, 20699/70

Int. Cl.² B32B *7/06*

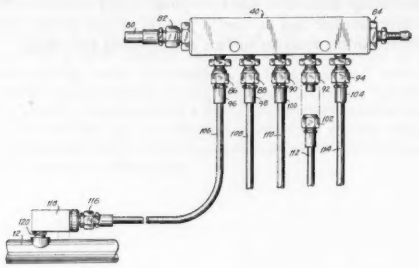
U.S. Cl. 428—483 **11 Claims**

1. A heat transfer material consisting essentially of a film carrier of polyethylene terephthalate, a thermoplastic layer consisting essentially of an acrylic resin adherent to said film carrier, said layer being essentially unpigmented, and a thermoplastic image in printing ink upon said acrylic resin layer, the acrylic resin having a hardness sufficient to reduce the bond between the polyethylene terephthalate carrier and acrylic layer upon application of heat, such bond at elevated temperatures being weaker than the bond between the thermoplastic image and a receiver surface at such elevated temperatures, whereby the carrier film may be stripped from said acrylic layer at substantially the same temperatures used to effect image transfer to leave the image firmly adhered to the receiver surface and at least a portion of said acrylic layer adhered to the receiver surface and covering said image.

3,928,711
MANIFOLD SYSTEM FOR RENEWING CABLE PRESSURE AND VALVE ARRANGEMENT THEREFOR

William J. Jakobsen, Farmingdale, N.Y., assignor to Lourdes Industries, Inc., Hauppauge, N.Y.

Division of Ser. No. 364,076, May 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 355,759, May 30, 1973. This application June 27, 1974, Ser. No. 483,897
Int. Cl.[2] H02G *15/28*
U.S. Cl. 174—11 R 28 Claims



1. Apparatus comprising a source of pressure medium, a plurality of pressurized communication system cables, manifold means coupled to said source for the distribution of said pressure medium from said source, and valve means coupled between said manifold means and said cables to deliver said pressure medium from the manifold to said cable, said valve means being responsive to a predetermined excess of pressure in respective of said cables relative to that in said manifold means due to a pressure loss related to one of said cables to seal off the respective cables with respect to said manifold means.

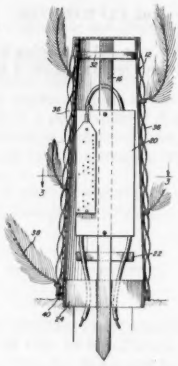
2. Apparatus as claimed in claim 1 comprising a plurality of connecting hoses respectively connected between said manifold means and said cables, said valve means including a plurality of valves each in a respective one of said connecting hoses for coupling the same to a respective one of said communication system cables and operative in response to a predetermined excess of pressure in the associated communication system cable relative to said manifold means to seal the associated cable from the associated connecting hose.

3,928,712
TERMINAL ENCLOSURE WITH ARTIFICIAL FOLIAGE

James C. Sears, Tonawanda, N.Y., assignor to Hinman Specialties, Inc., Buffalo, N.Y.

Filed Apr. 5, 1974, Ser. No. 458,446
Int. Cl.[2] A41G *1/00*; A47G *33/06*; H01R *13/52*
U.S. Cl. 174—38 2 Claims

1. In combination, an above ground utility terminal oriented in relation to a building, lawn, or other area such that the utility terminal is normally observable and represents a permanently installed unsightly above ground projection, and concealing means for the above ground terminal for concealing the utility terminal from a point adjacent ground surface to a point above the terminal, said utility terminal being in the form of a hollow enclosure enclosing the terminal components with the enclosure extending above ground and including a waterproof peripheral wall and top for protecting the terminal components, said concealing means including a pair of vertically spaced collars conforming generally in peripheral shape to the enclosure and mounted thereon in vertically spaced relation with the lower collar adjacent the ground surface and the upper collar adjacent the upper end of the enclosure, setscrew means extending through the lower collar for securing said collars removably to the enclosure, each of said collars including a peripheral outwardly extending flange, a plurality of spirally twisted rods extending between the flanges and rigidly secured thereto with the twisted rods being oriented in circumferentially spaced relation outwardly of the enclosure, a plurality of artificial foliage branches mounted on each of said rods for completely covering and concealing the rods, collars and enclosure to simulate foliage, each of the

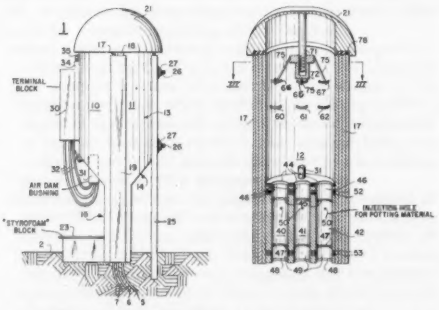


branches including a wire member attached to the twisted rod by wrapping the wire member around the twisted rod with the spiral twist in the rod serving to retain the branches in predetermined orientation on the rod thereby maintaining the continuity of the concealment of the terminal enclosure with the collars, rods and branches being removable from the enclosure as a unit to enable access to the enclosure and access to terminal components therein.

3,928,713
PRESSURIZED UNDERGROUND CABLE PEDESTAL

Glenn T. Davis, Rte. 2, Box 148-C, Monmouth, Oreg. 97361

Filed June 11, 1974, Ser. No. 478,323
Int. Cl.[2] H02G *9/02*
U.S. Cl. 174—38 6 Claims



1. A pedestal closure for enclosing above-ground extensions of underground cables comprising, a first riser portion, a second riser portion, said first and second riser portions mating and forming an upper pedestal portion comprising a splice chamber, an intermediate tapered pedestal portion and a lower relatively narrow pedestal portion, each of said riser

portions having a curved internal element in said relatively narrow pedestal portion and the elements of the two riser portions being opposed and defining plural spaced cable chambers, means forming a seal between said first and second riser portions, a cap engaging with said riser portions and closing said splice chamber defined thereby, the cap including sealing means between an edge of the cap and edges of the first and second riser portions which the cap abuts, means maintaining the riser portions in contact, means in said splice chamber for supporting cables, and cable terminal blocks supported on the exterior of one of said riser portions.

3,928,714

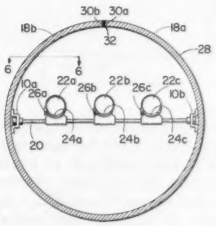
SIMULTANEOUS OIL AND ELECTRIC TRANSMISSION SYSTEM AND METHOD FOR FABRICATING SAME

Walter E. Matchett, R.R. No. 6, Portland, Ind. 47371

Continuation-in-part of Ser. No. 399,848, Sept. 24, 1973, abandoned. This application June 5, 1974, Ser. No. 476,592

Int. Cl.² H02G *9/00, 1/00*

U.S. Cl. 174—47 **10 Claims**



1. A method of fabricating a pipeline and conductor assembly comprising the steps of:

a. forming an elongated rectangular sheet of material into a U-shaped structure comprising a trough portion and a pair of upstanding flanges with the axis of said trough portion parallel to the length of said sheet;

b. placing a conductor in said trough portion in parallel relationship to said axis;

c. securing said conductor to said trough portion in spaced parallel relationship to the bottom and to said sides of said trough portion;

d. forming said U-shaped structure into a closed conduit with the elongated edges of said sheet proximal to each other;

e. attaching longitudinally spaced and transversely oriented conductor-supporting rods between opposite sides of said U-shaped structure prior to said placing operation;

f. attaching said conductor to said rods subsequent to said placing operation;

g. attaching pairs of rod-supporting brackets to one surface of said rectangular sheet of material with each pair spaced longitudinally from another pair and with each bracket of a pair spaced transversely from the other bracket of the same pair, prior to said first forming operation; and

h. attaching one of said conductor-supporting rods between each pair of said brackets, subsequent to said first forming operation.

7. A pipeline and conductor assembly which comprises:

a. a conduit of formed sheet construction having a closed and fluid-tight cross section;

b. a conductor being longitudinally disposed in said conduit and maintained in spaced parallel relationship to the inner walls of said conduit;

c. said assembly includes a plurality of rod-supporting brackets being attached to the inside of said conduit on oppositely opposing inner walls thereof, and forming longitudinally spaced pairs of brackets with each bracket located on a plane parallel to the longitudinal axis of said conduit and with each pair of brackets located on a transverse plane of said axis; each assembly includes a plurality of conductor-supporting rods, each having one end thereof attached to one bracket of one of said pairs and each having the other end thereof attached to the other bracket of said pair; and said brackets, said rods, and attaching of said conductor to said rods provides said maintenance of said spaced parallel relationship of said conductor to said inner walls; and

d. each of said conductor-supporting rods comprises a rod portion and flanged end connectors connected to opposite ends of said rod portion; each of said brackets includes slotted plate means, being spaced from the inside surface of said conduit, for receiving one end of each of said flanged end connectors and for securing said rods by said flanged end connectors; and said attachment of said conductor-supporting rods comprises said flanged end connectors and said slotted plate means.

3,928,715

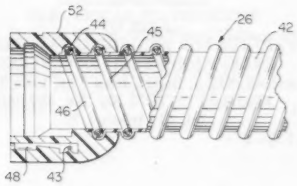
VACUUM CLEANER HOSE ASSEMBLY AND APPARATUS AND METHOD USED IN MAKING SAME

Homer N. Holden, Sylva, N.C., assignor to Dayco Corporation, Dayton, Ohio

Filed Oct. 31, 1974, Ser. No. 519,909

Int. Cl.² F16L *11/12;* **H01B** *7/00*

U.S. Cl. 174—47 **16 Claims**



1. A vacuum cleaner hose assembly comprising, an elongated vacuum hose having opposite ends and a central longitudinal axis, a plurality of electrical conductors extending in a helical pattern along said vacuum hose with each conductor having opposite end portions each disposed in a helical path about said longitudinal axis and each said opposite end portion being arranged immediately adjacent the associated opposite end of said vacuum hose, a plurality of electrical connectors each fixed to an associated end portion of each conductor while being disposed substantially parallel to said longitudinal axis, each of said electrical connectors comprising a knife-like portion provided with opposed edges defining sides of a slot, each knife-like portion being arranged generally transverse the helical path of the associated end portion of its conductor with the conductor end portion being wedged between said opposed edges to provide a firm mechanical and electrical connection, and a pair of hose connectors fixed to said opposite ends of said vacuum hose and formed substantially as an integral part thereof, each of said hose connectors having associated ones of said electrical connectors embedded therein and providing the sole support therefor.

3,928,716

ELECTRICAL OUTLET BOX ASSEMBLY

Louis Marrero, 13004 Via Del Valedor, San Diego, Calif. 92129

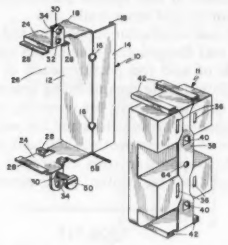
Filed Dec. 13, 1973, Ser. No. 424,437

Int. Cl.² H02G *3/12*

U.S. Cl. 174—57 **10 Claims**

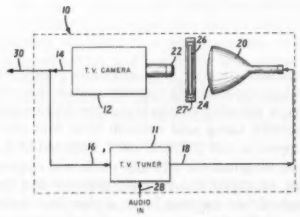
1. An electrical outlet box assembly comprising:

a. a mounting bracket element having a pair of substantially planar spaced parallel wall members joined at one edge by an orthogonal wall member, said members defining a channel;
b. a wiring box element having a front face with outlet openings therein and terminal means connectable to a source of power;



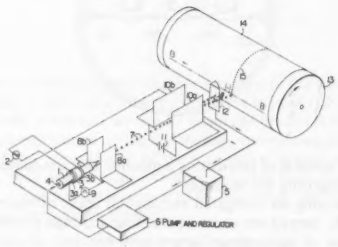
c. one of said elements having track means and the other of said elements having rail means slideably engaged with said track means such that said wiring box is slideably received in said channel; and
d. said bracket element having a substantially L-shaped support fastenable to a substantially orthogonal edge of building stud.

3,928,717
APPARATUS FOR PROVIDING PATTERNS ON TELEVISION RECEIVER SCREENS
Lee A. Dorland, 812 S. Dodge, Iowa City, Iowa 52240
Filed July 17, 1974, Ser. No. 489,360
Int. Cl.² H04N *5/72*
U.S. Cl. 178—6 **1 Claim**



1. An apparatus for producing pleasing images on a TV receiver comprising:
a. a TV camera having a lens, said TV camera capable of producing an electronic signal representative of an optical scene;
b. a pattern generator which varies the frequency of said electronic signal in response to an audio signal present at an audio input of said pattern generator, said pattern generator comprising an audio controlled TV tuner having an input for an audio signal and including means for varying said electronic signal in frequency, with the amount of said variation being determined by the intensity of the audio signal;
c. means for connecting said pattern generator to a kinescope, the screen of which said lens is aimed at to form a feedback loop;
d. a slide holder interposed between said lens and said screen, said slide holder being spaced adjacent to said screen, whereby the planes of said screen and of said slide holder are both substantially in focus of said lens at the same time;
e. a slide in said slide holder, the image on said slide altering said feedback loop;
f. output means for connecting an external TV receiver to an output of said TV camera; and
g. an external TV receiver connected to said output means for viewing said pleasing images.

3,928,718
IMAGE REPRODUCING SYSTEM
Syoji Sagae, Hitachiota, and Tetsuo Doi, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan
Filed May 7, 1974, Ser. No. 467,795
Claims priority, application Japan, May 9, 1973, 48-50757; July 25, 1973, 48-83089; July 25, 1973, 48-83090
Int. Cl.² H04N *1/22*; **G01D** *15/18*
U.S. Cl. 178—6.6 R **10 Claims**



1. An image reproducing system comprising means for producing an image signal including components representing the relative density of successive portions of an original carrying an image to be recorded on a recording medium in a plurality of scanning lines, means for emitting ink droplets of predetermined size from a nozzle in accordance with the operating period of a vibration imparting element mounted on said nozzle, means for producing a signal in synchronizm with the emission of said ink droplets from said nozzle, means for dividing the frequency of the signal produced in synchronism with the emission of said ink droplets thereby determining the maximum number of ink droplets to be emitted within the period of frequency division, means for converting the pulses appearing within said period of frequency division into pulses corresponding to the relative density of the successive portions of the image in response to the application of said image signal components and the output signal of said frequency dividing means, means for charging said ink droplets emitted from said nozzle on the basis of the output of said converting means, means for deflecting said charged ink droplets from the flying path depending on the charge carried by said ink droplets and means for varying the printing density of dots in the dot pitch on the same scanning line depending on the relative density of the successive portions of the original.

3,928,719
IMAGE DISPLAY SYSTEM

Kaoru Sasabe, Ikeda; Hiroaki Kotera, Takatsuki; Toshihide Hane, Sakai, and Nobuyoshi Kihara, Amagasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

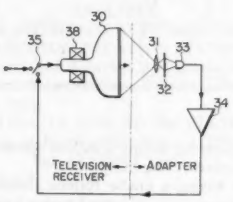
Filed Mar. 23, 1973, Ser. No. 344,203

Claims priority, application Japan, Mar. 25, 1972, 47-30197; Mar. 25, 1972, 47-30198; Mar. 31, 1972, 47-32925; Mar. 31, 1972, 47-32926; Mar. 31, 1972, 47-32927; Apr. 13, 1972, 47-37478

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl.² H04N *5/36, 5/68*

U.S. Cl. 178—6.8 **7 Claims**



1. An image display system comprising a scan/display device capable of scanning with a flying spot, a picture information carrier scanned by the flying spot of said scan/display device, a photoelectric transducer for converting light modified by said picture information carrier into a corresponding electric signal, means, responsive to the electric signal produced from said photoelectric transducer, for amplifying said electric signal and feeding back positively an output signal corresponding to the amplified electric signal, said means for amplifying including a stabilizing device for limiting the output signal at a predetermined level, and means for leading the output signal produced from said amplifying means and video signals from video signal generators either simultaneously or selectively to said scan/display device.

3,928,720
SYNCHRONIZING SIGNAL REGENERATOR

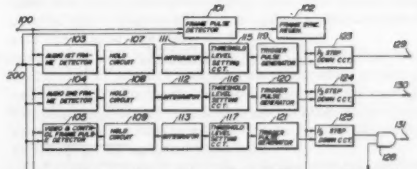
Yoshizumi Watatani, Machida; Katsuo Mohri, Yokohama; Masaaki Fukuda, Kodaira; Tatsuo Kayano, Hachioji, and Takehiko Yoshino, Yokohama, all of Japan, assignors to Hitachi, Ltd.; Hitachi Electronics Co., Ltd. and Hoso Kyokai, all of Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,822

Claims priority, application Japan, May 23, 1973, 48-56823

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.5 G **10 Claims**



1. A synchronizing signal regenerator for regenerating a first synchronizing signal including a pulse series having a predetermined certain repetition frequency being intermittently transmitted at a predetermined period for a predetermined certain duration, and a second synchronizing signal synchronized with boundaries of the pulse series of the first synchronizing signal and inserted in a repetition period for a period equal to a width of the pulse series intermittently inserted, from a composite signal including said first and second synchronizing signals, the regenerator comprising:

a means for detecting said second synchronizing signal and for regenerating said detected second synchronizing signal;

a means for detecting and deriving the pulse series of said first synchronizing signal;

a hold circuit for producing a wide width output pulse signal when a pulse of the detected pulse series is obtained at an interval less than a predetermined time interval;

an integrator for integrating the output pulse signal of the hold circuit and providing an output signal;

a means for producing a trigger pulse when an amplitude of the output signal of the integrator exceeds a certain determined level; and

a means for generating a signal synchronized with said intermittently transmitted frequency of the pulse series of said first synchronizing signal, said generating means including a frequency dividing means for dividing the frequency of said regenerated second synchronizing signal obtained from the second synchronizing signal regenerating means, including means for using said regenerated second synchronizing signal as a clock pulse and means for using the trigger pulse obtained from said trigger pulse producing means as a clear pulse.

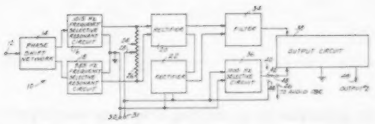
3,928,721
ELECTRICAL WAVE FILTER

Thomas W. Holden, 301 W. 16th Place, Chicago Heights, Ill. 60411

Filed Nov. 23, 1973, Ser. No. 418,377

Int. Cl.² H04L *15/24*

U.S. Cl. 178—88 **18 Claims**



1. In an electric wave filter including input and output terminals, and a plurality of frequency selective networks interposed between said input and output terminals and resonant at respective frequencies lying on either side of a predetermined input frequency such that a substantial output signal will appear at the output terminals at the predetermined input frequency while frequencies relatively remote from said predetermined input frequency will be substantially attenuated, the improvement comprising:

a. a coupling circuit for providing outputs from the networks when the input terminals are excited at the predetermined input frequency and the frequency selective networks are in a steady state condition, and

b. said coupling circuit including energy absorbing means coupled between said networks so as to absorb energy from the networks during the rise times and decay times of successive input pulses of alternating current energy of said predetermined input frequency applied to said input terminals, and said outputs from the networks having a phase relationship so as to be substantially in opposing relation with respect to the production of current flow in said energy absorbing means and so as to produce in said energy absorbing means essentially zero current flow

after the input terminals have been excited by the predetermined input frequency and the frequency selective networks are in a steady state condition; and

c. said energy absorbing means being of sufficient value to damp oscillation in the respective networks to substantially zero amplitude, when the input frequency is removed, within a time interval not substantially greater than a minimum repetition interval between input pulses.

3,928,722

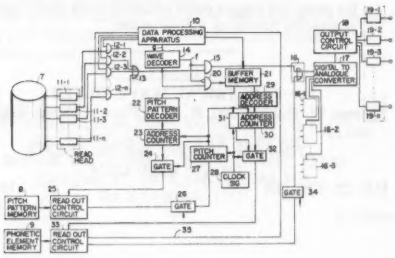
AUDIO MESSAGE GENERATING APPARATUS USED FOR QUERY-REPLY SYSTEM

Kazuo Nakata, and Akira Ichikawa, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed July 16, 1973, Ser. No. 379,230

Int. Cl.[2] H04Q *3/00*

U.S. Cl. 179—1 SM **7 Claims**



1. An apparatus for generating a replying voice signal composed of at least one variable word and a plurality of fixed words forming a reply sentence comprising:

a. first memory means for recording a plurality of reply sentences each in the form of word signals corresponding to the voice waveform of each of the fixed words of the reply sentence and control signals having first and second values to designate the position of a fixed or variable word in an output reply sentence;

b. data processing means responsive to a control input for initiating reading out of a selected reply sentence from said first memory means, including means for converting said reply sentence signals into audio signals;

c. pitch pattern information memory means for recording pitch patterns of each variable word;

d. voice segment memory means for recording a series of voice segment waveforms associated with each variable word; and

e. control circuit means responsive to said control signals from said first memory means designating each variable word for reading out pitch patterns from said pitch pattern information memory means and voice segment waveforms from said voice segment memory means, including means for introducing the voice signal formed of the pitch pattern information and voice segment waveforms of the variable word amongst the word signals of the reply sentence composed of the fixed words applied to said converting means of said data processing means.

3,928,723

TELEPHONE SET WITH BUILT-IN LOUDSPEAKER

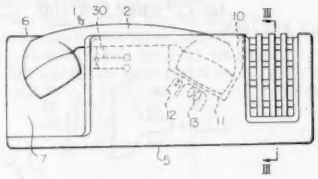
Kazuo Kai, 12 Kuwazucho 6-chome, Higashi Sumiyoshi, Osaka, Osaka, Japan

Filed June 26, 1974, Ser. No. 483,103

Claims priority, application Japan, July 2, 1973, 48-78601[U]; July 2, 1973, 48-78602[U]; **July 2, 1973, 48-78603**[U]; **Sept. 4, 1973, 48-103792**[U]

Int. Cl.[2] H04M *1/20, 1/60*

U.S. Cl. 179—1 FS **4 Claims**



1. A telephone set having a built-in speaker for use with a telephone receiver, comprising:

a. a stand having a cradle formed therein for holding a telephone receiver, said stand having a sound reflector or focusing horn with a focusing point at the position of the transmitter of the receiver when placed in the cradle;

b. a pickup coil positioned in said stand to face the receiver when it is placed in the cradle;

c. an amplifier having an input connected to said pickup coil and having an output;

d. a switch positioned on said stand for actuation by the receiver when placed in said cradle, said switch for connecting said amplifier to a source of power when actuated by the receiver;

e. a speaker case mounted within said stand;

f. a speaker mounted within said speaker case and connected to said output of said amplifier;

g. a feedback coil coupled to said pickup coil; and

h. a feedback resistor connected from the output of said amplifier to said feedback coil.

3,928,724

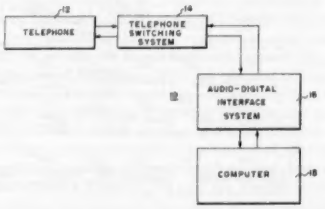
VOICE-ACTUATED TELEPHONE DIRECTORY-ASSISTANCE SYSTEM

Harold E. Byram; Ronald J. Lockard; Roland D. Andersen, and Vincent L. Carney, all of Lincoln, Nebr., assignors to Andersen, Byram, Kouma, Murphy, Lockard & Carney, Lincoln, Nebr.

Filed Oct. 10, 1974, Ser. No. 513,562

Int. Cl.[3] G01L *1/08;* **H04M** *1/26*

U.S. Cl. 179—1 SD **23 Claims**



1. A voice-actuated automatic directory-assistance system adapted to be connected to a telephone switching system for communication with any of a plurality of telephones comprising:

signal carrier means for receiving audio signals from said telephone switching system representing the names of subscribers;

return signal means for supplying audio signals to the telephone representing at least the telephone numbers of said subscribers in response to the audio signals from said signal carrier means;

said signal carrier means including means for receiving audio signals from said telephone switching system representing at least letters of the alphabet;

said return-signal means including conversion means for converting each of the audio signals representing letters of the alphabet to a signal compatible with a computer memory system and for applying said signals to said computer memory system.

3,928,725

PAM/PCM INTERFACE NETWORK FOR TDM TELECOMMUNICATION SYSTEM

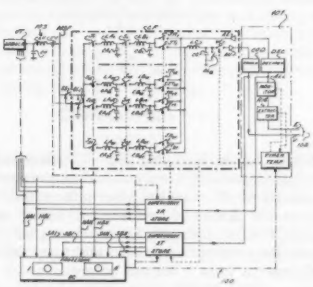
Giuseppe Valbonesi, and Roberto Camiciottoli, both of Milan, Italy, assignors to Societa Italiana Telecomunicazion Siemens S.p.A., Milan, Italy

Filed Nov. 12, 1974, Ser. No. 523,145

Claims priority, application Italy, Nov. 12, 1973, 31186/73

Int. Cl.² H04J *3/04*

U.S. Cl. 179—15 AA **10 Claims**



1. In a telecommunication system, in combination:

a central office;

a multiplicity of local lines terminating at said central office;

sampling means at said central office including a set of individual capacitors respectively connected to said local lines for receiving analog message samples originating at and destined for at least some of said local lines during respective time slots of a recurrent scanning cycle;

a pulse-code-modulation link with an outgoing path and an incoming path extending from said central office to a remote exchange for carrying messages to and from said local lines in a PCM frame recurring at substantially the same frequency as said scanning cycle, said frame being divided into a number of channels equal to the number of said time slots;

a coupler between said sampling means and said link with a plurality of parallel branches each including a pair of cascaded sections for the temporary storage of a message sample, one section of each branch being periodically connectable by said sampling means to the individual capacitor of an assigned local line;

a set of circuit breakers normally isolating said one section of each branch from the other section thereof;

a set of normally open transmit switches between said other section of each branch and said outgoing path;

a set of normally open receive switches between said other section of each branch and said incoming branch;

locally controlled first timing means for momentarily closing each of said circuit breakers and each of said transmit switches in staggered relationship once per scanning cycle for transferring departing message samples from said one section of any of said branches via said other section thereof to said outgoing branch;

second timing means controlled from said remote exchange via said link for momentarily closing each of said receive switches in staggered relationship once per scanning cycle for transferring arriving message samples from said incoming path to said other section of any of said branches preparatorily to delivery to a local line by way of said one section thereof, said first and second timing means having substantially the same operating frequency; and

monitoring means connected to said first and second timing means for relatively phase-shifting same upon deviation of the relative closure times of said transmit and receive switches from a predetermined range, thereby maintaining an invariable closure sequence in each branch.

3,928,726

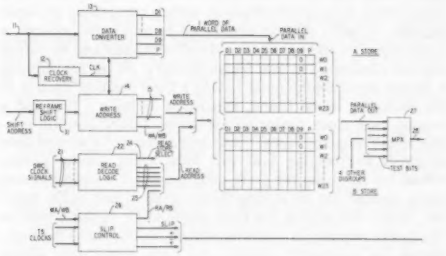
COMMON CONTROL VARIABLE SHIFT REFRAME CIRCUIT

John Robert Colton, Freehold; Robert Bruce Heick, Eatontown, and Henry Mann, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 22, 1974, Ser. No. 526,107

Int. Cl.² H04J *3/06*

U.S. Cl. 179—15 BS **16 Claims**

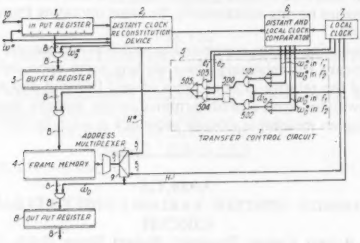


1. In a time division switching system wherein a plurality of digital groups of time division multiplexed channels are time multiplexed together on to a common bus, each digital group including a similar predetermined framing bit pattern; a reframer circuit comprising means for storing a given number of selected data bits including the assumed framing bit of each digital group and for cyclically reading the data bits of each digital group out of store in time coincidence with the appearance of each digital group on said common bus, comparator means serving to compare the output of said means with data bits of the same digital group that occur one or more frames later in time, suitability stoage means for recording for each digital group which of selected compared data bits have had framing pattern violations and which appear as suitable candidates for the framing bit, shift decoder means coupled to the output of said comparator means and said suitability storage means for determining how many digit shifts should be made based on the present set of comparisons and the past suitability record in said suitability storage means, means for shifting the data stored in the first recited means and for shifting the data recorded in said suitability storage means by a determined amount based on a digit shift indication from said shift decoder means, and means for shifting the multiplexed data bits of an out-of-frame digital group by a determined amount based on the digit shift indication from said shift decoder means.

3,928,727
SYNCHRONIZATION DEVICE FOR TIME-MULTIPLEXED SIGNAL TRANSMISSION AND SWITCHING SYSTEMS

Alain Y. Roche, 41 rue du Sergent L'Heveder, 22700 Perros-Guirec, France

Filed Dec. 23, 1974, Ser. No. 535,584
Int. Cl.² H04J 3/06
U.S. Cl. 179—15 BS **5 Claims**



1. A device for synchronization of a digital time-multiplexed signal comprising time slots containing pulse code modulation signals respectively assigned to transmission channels, and multiplexed in frames, the frames and time slots of the incoming signal to said synchronization device being defined by a distant clock and the frames and time slots of the outgoing signal from said synchronization device being defined by a local clock, said synchronization device comprising an input register, a buffer register connected to said input register, a frame memory connected to said buffer register and an output register connected to said frame memory, means for defining a distant clock timing pulse having a fixed position relative to the incoming signal frame, means for defining a first and a second local clock timing pulses having a fixed position relative to the outgoing signal frame and a first and a second time windows overlapping said two local clock timing pulses, means for receiving the pulse code modulation signals in said input register and for storing these signals in said buffer register, means for writing the code modulation signals stored in the buffer register, at a writing instant, in the frame memory, means for recurrently reading the code modulation signals written in the frame memory, means for detecting, in each outgoing signal time slot, the coincidence of the distant clock timing pulse with the first and the second time windows and thereby respectively selecting as writing instant, the second and the first local clock timing pulse, means for switching the writing instant from the first to the second local clock timing pulse at switching instants and means for selecting as said switching instants, instants located in the time slot following the time slot during which the coincidence has been detected when the two writing instants to be switched to one another are in different time slots and instants located in the very time slot during which the coincidence has been detected and in said time slot between the first and second local clock timing pulses when the two writing instants to be switched to one another are in the same time slot.

3,928,728
NUMBER IDENTIFICATION CIRCUIT

Hiromi Moriyama, Fujisawa; Motosuke Kuwabara, Yokohama, and Katsuyuki Jin, Kawasaki, all of Japan, assignors to Hitachi, Ltd., Japan

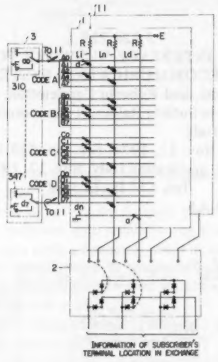
Filed Mar. 13, 1974, Ser. No. 450,775
Claims priority, application Japan, Mar. 26, 1973, 48-33606
Int. Cl.² H04Q 3/72
U.S. Cl. 179—18 FH **4 Claims**

1. A number identification circuit with a two-out-of-five diode matrix, comprising:

a plurality of number information line sets corresponding to respective digits of a subscriber's number, each number information line set including five number information lines representative of respective elements of number information used on a two-out-of-five basis;

a pluraliity of output lines to be identified corresponding to respective numbers, said number information lines and said output lines being arranged in a matrix configuration;

number setting means including a plurality of diode pairs each of which connects a selected one of said output lines to two selected number information lines of one of said number information line sets in accordance with number information elements for one digit of the number corresponding to the selected output line;



controlling means including first DC power source means for applying during nonidentification time periods a first potential to all of said number information lines which causes the diodes of said number setting means to be conductive and for applying only during an identification operation time period only to said two selected number information lines a second potential which causes the diodes of said number setting means associated therewith to be nonconductive while applying the first potential to nonselected number information lines; and

second DC power source means, whereby outputs are applied from said second DC power source means only to the output lines to which the diodes connected to said two selected number information lines are connected as an identification of the respective digits.

3,928,729
CIRCUITRY FOR PROVIDING EXECUTIVE RINGBACK IN A PBX SYSTEM IN ACCORDANCE WITH A SUPPLIED CLASS OF SERVICE

Carl Calvin Nielson, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 3, 1974, Ser. No. 511,802
Int. Cl.² H04M 3/48
U.S. Cl. 179—18 BG **14 Claims**

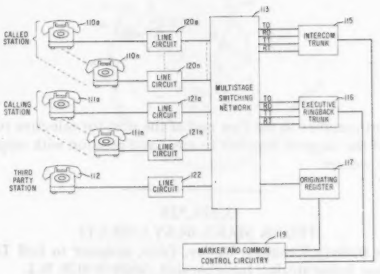
1. In a telephone switching system having a plurality of line circuits terminated in station sets, said line circuits being interconnectable to a plurality of trunk circuits through a multistage switching network, the invention comprising executive ringback circuitry for completing a connection between a calling station and a called station at the conclusion of a connection between said called station and a third party station, said executive ringback circuitry including

means for determining the class of service provided to said calling station,

means for detecting a busy condition of said called station,

means for determining a class of service provided to said called station,

means, responsive to said calling station class of service determining means, said called station busy condition detecting means, and said called station class of service determining means, for seizing said executive ringback circuitry provided said calling station is equipped with a class of service permitting executive ringback and said called station is equipped with a class of service allowing executive ringback, and



means, subsequently activated by said seizing means and responsive to a switchhook flash from said calling station, for effecting the establishment of executive ringback connections between said calling station and said called station at the conclusion of said connection between said called station and said third station.

3,928,730

MATRIX MODULE AND SWITCHING NETWORK

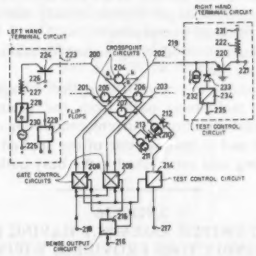
Einar Andreas Aagaard; Johannes Wilhelmus Coenders, and Eise Carel Dijkmans, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,547

Claims priority, application Netherlands, July 1, 1974, 7408823

Int. Cl.² H04G 9/00; H04M 3/00

U.S. Cl. 179—18 GF **11 Claims**



1. A matrix module, comprising electronic crosspoint elements which are arranged at crosspoints of two groups of conductors, separately denoted as horizontal and vertical conductors, and which are each provided with a first main electrode connected to the horizontal conductor and a second main electrode connected to the vertical conductor and also with a control gate, the control gates of the crosspoint elements connected to the same vertical conductor being connected to a gate control circuit which is connected to the vertical conductor, wherein the matrix module comprises a selection signal input, accessible to a central control unit, and first means for deriving control signals from the selection signal input so as to control the gate circuits therewith.

3,928,731

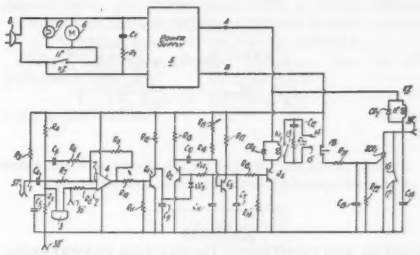
REPERTORY DIALER

Herbert I. Cohen, Point Pleasant Beach, N.J., assignor to Acron Corporation, Lakewood, N.J.

Continuation of Ser. No. 133,620, April 13, 1971. This application May 14, 1973, Ser. No. 360,107

Int. Cl. H04m 1/46

U.S. Cl. 179—90 BB **5 Claims**



1. An electronic circuit for recording electrical signals representing telephone number information and subsequently for controlling the energization of relay means as a function of said electrical signals, said circuit comprising:

dial means for generating electrical signals representing telephone number information;

magnetic head means for recording said electrical signals,

means connected to said magnetic head an to said dial means for differentiating said electrical signals and for recording said differentiated electrical signals;

amplifier means connected to said magnetic head means for amplifying said recorded electrical signals;

transistor means including resistor-capacitor control means therefor, connected to the output of said amplifier means for blocking the output of said amplifier means unless such output exceeds a predetermined amplitude determined by said transistor means, and time duration determined by said resistor-capacitor means;

monostable multivibrator means connected to said transistor means for producing a pulse type output signal as a function of the output of said transistor means; and

relay driver means including relay means connected to said multivibrator means for controlling the connecting and disconnecting of said relay means as a function of said pulse type signal.

3,928,732

EXTENSION AND LINE INDICATING DISPLAY SYSTEM FOR KEY TELEPHONE SYSTEM

William F. Simon, Duluth, Minn., and William C. Torrey, Superior, Wis., assignors to Telephone Associates, Inc., Superior, Wis.

Filed Nov. 19, 1973, Ser. No. 416,849

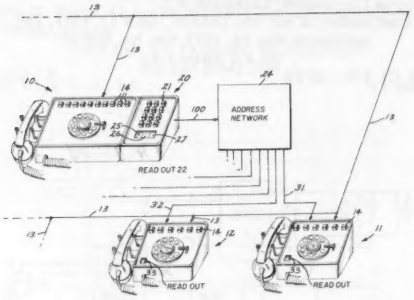
Int. Cl.² H04M 1/21

U.S. Cl. 179—99 **12 Claims**

1. Apparatus for use in conjunction with a key telephone system for handling incoming calls, comprising:

a a plurality of digital readouts each associated with an extension of said key system, said digital readouts for visual display of data indicating the line on which an incoming call is received; and

b means for receiving extension and line data corresponding to an incoming call and for transmitting the line data for



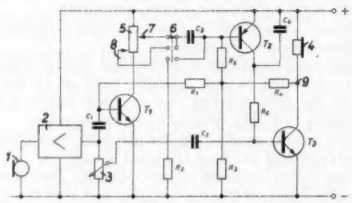
display by the digital readout associated with the extension corresponding to the received extension data.

3,928,733

HEARING AID CONTROL CIRCUIT FOR SUPPRESSING BACKGROUND NOISE

Fritz Hueber, Vienna, Austria, assignor to Viennatone Gesellschaft m.b.H., Vienna, Austria

Filed Nov. 20, 1974, Ser. No. 525,552
Claims priority, application Austria, Nov. 21, 1973, 9757/73
Int. Cl.² H04R 25/00
U.S. Cl. 179—107 R **10 Claims**



1. In a control circuit connected between a microphone and an emitter of a hearing aid, the microphone receiving an input signal and the circuit being arranged to transmit the input signal to the emitter, and the circuit including a low-frequency channel comprising a signal amplifier connected to the microphone and an output stage amplifying transistor connected to the emitter, the improvement of a threshold switching means connected to the low-frequency channel and arranged to block transmission of the input signal from the microphone to the emitter below a predetermined threshold level of the signal, the low-frequency signal in the low-frequency channel controlling the switching means.

3,928,734

ORNAMENTED SUPPORT COLLAR FOR MICROPHONE AND THE LIKE

Jerry Lewis Noury, Jr., 522 W. 29th St., New York, N.Y. 10001

Filed Oct. 21, 1974, Ser. No. 516,634
Int. Cl.² H04M 1/05
U.S. Cl. 179—157 **9 Claims**

1. A support for a microphone or the like comprising a collar formed of a substantially rigid outer portion and a protective lining covering the inner surface thereof, means to removably secure the collar around a wearer's neck, a single straight post extending from the front of the collar, means to removably secure the post to the collar, a support member for a microphone or the like, and means to frictionally secure the

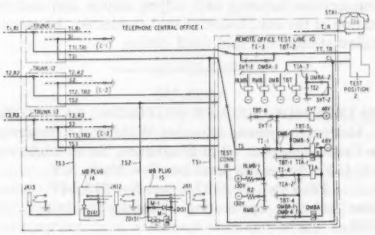
support member to the free end of the post for selective rotation of the support member to any fixed position with respect to the wearer.

3,928,735

TRUNK MAKE-BUSY CIRCUIT

James Blakely Kennedy, Bexley, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Division of Ser. No. 432,083, Jan. 9, 1974, Pat. No. 3,875,351.
This application Dec. 23, 1974, Ser. No. 535,564
Int. Cl.² H04B 3/46; H04M 3/12
U.S. Cl. 179—175.3 R **4 Claims**



1. A make-busy plug for use in removing a telephone central office trunk from subscriber service and for use in restoring the trunk to subscriber service by a trunk test circuit arranged to selectively apply voltages between a busy lead of the trunk and a ground terminal comprising

directional current conducting means for making the trunk appear busy, and

means responsive to one of the applied voltages for establishing a make-busy path from the ground terminal through said directional current conducting means to the busy lead and to another one of the applied voltages for interrupting said established make-busy path.

3,928,736

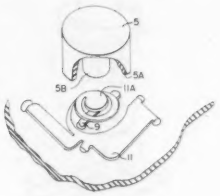
KEYBOARD SWITCH ASSEMBLY HAVING DISCRETE HELICAL CONDUCTORS PROVIDING WIPING ACTION

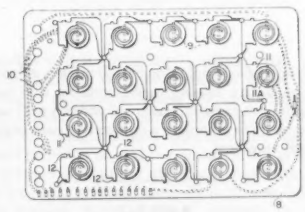
James John Drage, Uxbridge, England, assignor to Sumlock Anita Electronics Limited, Uxbridge, England

Filed May 7, 1974, Ser. No. 467,667
Claims priority, application United Kingdom, May 11, 1973, 22538/73
Int. Cl.² H01H 13/52, 1/06
U.S. Cl. 200—5 A **2 Claims**

1. A keyboard comprising a cover plate; a plurality of push buttons movably mounted within the cover plate; an insulating base plate spaced from the buttons bearing a first set of longitudinally directed fixed contacts on that side of the base plate facing said push buttons, each contact of this set located opposite one of the push buttons; and a plurality of contact plates, each contact plate affixed to said base plate in a posi-

tion co-operating with a corresponding button and a corresponding one of the first set of contacts; wherein the contact plates each comprises a strip of electrically conducting material having at least one tag securing the strip to the base plate and a resilient part with a free end spaced away from said base plate to engage one said push button at a position normally extending towards the corresponding contact of the first set of





contacts to make electrical wiping contact therewith when the push button is moved toward said base plate; and wherein the resilient part of the contact plate comprises an integral part of the contact plate cut out of the contact plate with a helical slot thereby forming a helically shaped conductor which engages said longitudinally directed fixed contact in a wiping action in at least two spaced positions on said helically shaped conductor when said push button is moved toward said base plate.

3,928,737

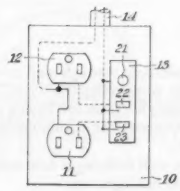
REMOTE CONTROL SWITCHING DEVICE

Lopsadhayoodh Prasert, Bangkok, Thailand, assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,329

Int. Cl.² H01R *13/70*

U.S. Cl. 200—51 LM **4 Claims**



1. A female electrical socket and a mating attachable plug for individually joining some of the electrical conductors in the socket to the conductors of the electrical plug, in which contact making device of the female socket is an assembly of two contact members that are each attachable to individual conduct wires and spring-biased to contact each other except when a male contact of the plug is engaged in the contact assembly, said male contact then acting to separate the two contact members from contacting each other,

said male contact being in the form of a metal strip, a section of which is coated with an insulating material and shaped so that, when engaged, the male contact of the plug electrically contacts one of the two contact members of the contact making device of the socket and is insulated electrically from the other contact member of the assembly.

3,928,738

COUPLING ARRANGEMENT FOR A COMPRESSED-GAS CIRCUIT BREAKER EQUIPPED WITH A HYDRAULIC DRIVE

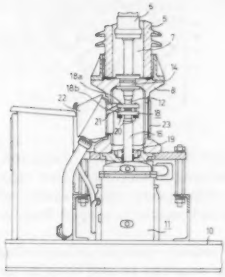
Helmut Beier, and Dieter Noack, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 2, 1974, Ser. No. 457,233

Claims priority, application Germany, Apr. 4, 1973, 2317499

Int. Cl.² H01H *35/38*

U.S. Cl. 200—82 B **6 Claims**



1. In a compressed-gas circuit breaker such as a high-voltage power breaker or the like, the breaker including: a closed gas circuit for gas utilized as an arc-quenching and insulating medium; an enclosure containing the gas; a contact system mounted in the enclosure; an actuator rod connected to the contact system for actuating the same, the actuator rod having a plunger portion extending from the enclosure; and, a hydraulic drive containing a hydraulic fluid and having a piston rod connected to the plunger portion of the actuator rod for actuating the contact system, the improvement of a coupling arrangement comprising: an air-filled housing containing the plunger portion and the piston rod therein; a coupling connecting the plunger portion directly to the piston rod in said housing; and, a gas-tight bushing on said housing surrounding the plunger portion for facilitating the penetration of the plunger portion into said housing from the enclosure in a gas-tight manner; said housing being disposed directly between the enclosure and the hydraulic drive whereby hydraulic fluid from the hydraulic drive is prevented from penetrating the gas containing enclosure in the event of a failure of said bushing.

3,928,739

NORMALLY OPEN TYPE PUSH BUTTON SWITCH OPERATING MECHANISM

Toshiaki Miyamae, 2-16, 2-chome,, Nishi-Iwata, Higashi-Osaka, Osaka-Pref., Japan

Filed Sept. 9, 1974, Ser. No. 504,050

Int. Cl.² H01H *3/02, 3/32*

U.S. Cl. 200—155 R **4 Claims**

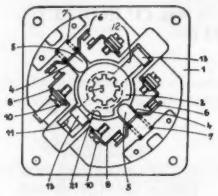
1. A normally open type push button switch operating mechanism comprising a switch housing, a base plate fixedly mounted on the upper portion of said housing, an actuating plate having one end pivotally supported on said base plate, a contact element protruding from said base plate in a position contactable with the underneath portion of said actuating

plate, a cam movably supported on one end of said base plate, the other end of said actuating plate formed to frictionally contact said cam, a knob fixedly connected to said cam outwardly of said base plate, a resilient means held between said base plate and said actuating plate to normally hold said actuating plate in contact with said contact element.

3,928,740
ROTARY SWITCH

Gottfried Alsch, Vienna, Austria, assignor to Hubert Laurenz Naimer, Vienna, Austria

Filed Feb. 21, 1974, Ser. No. 444,365
Claims priority, application Austria, Feb. 23, 1973, 1627/73
Int. Cl. H01l *19/62*
U.S. Cl. 200—153 LB **3 Claims**



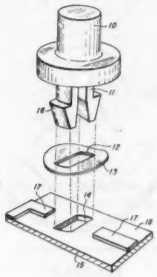
1. A rotary switch having an axis of rotation and comprising:
a. a housing defining a plurality of first radial guide grooves and a second radial guide groove axially adjacent said first guide grooves and angularly spaced from each of said first grooves;
b. a plunger radially movable in each of said first grooves;
c. a cam disc mounted in said housing for rotation about said axis and having a cam face opposite said first grooves;
d. first yieldably resilient means biasing each plunger toward engagement with cam face;
e. a star wheel secured to said cam disc for joint rotation about said axis;
f. a detent element radially movable in said second groove;
g. second yieldably resilient means biasing said detent element toward engagement with said star wheel; and
h. a plurality of contact bridges mounted in said housing and operatively connected to respective ones of said plungers for operation when the connected plungers are moved during rotation of said cam disc against the biasing of said first yieldably resilient means.

3,928,741
MOMENTARY CONTACT SINGLE POLE SWITCH

Jerry L. Comer, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 16, 1974, Ser. No. 506,485
Int. Cl.² H01H *3/12, 13/52*
U.S. Cl. 200—159 R **11 Claims**

1. A momentary-contact single-pole electrical switch comprising:
a. a substrate having two major surfaces with an opening therethrough extending from one of said major surfaces to the other major surface, said substrate including a plurality of electrically conductive terminal members on said one major surface approximately equidistant from said opening;
b. a non-conductive pushbutton actuator having a button and two legs with each of said legs having a retention means on the end thereof, said legs extending through said opening with said button facing said one major surface and with said retention means extending beyond the edge of said opening on said other major surface; and
c. conductive biasing means between said button and said one major surface being retained by said legs with said conductive biasing means normally biasing itself and said button away from said terminal members; wherein

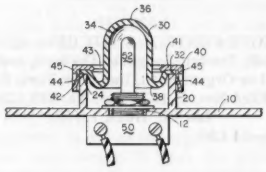


d. depression of said actuator button applies a force against said conductive biasing means causing said conductive biasing means to make electrical contact with said terminal members to complete a conductive path between said terminal members.

3,928,742
FLUID-TIGHT FLEXIBLE COVER

Clinton Rule, Beverly Farms, Mass., assignor to Rule Industries, Inc., Gloucester, Mass.

Filed July 12, 1974, Ser. No. 487,873
Int. Cl.² F16J *15/50;* **H01H** *9/04*
U.S. Cl. 200—302 **9 Claims**



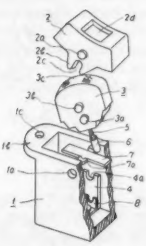
1. A flexible fluid-tight through-wall cover arrangement for manipulable wares comprising:
A. a walled fluid-tight enclosure having an aperture adapted to receive or expose the manipulable element of a ware therethrough;
B. a continuous wall defining a dam surrounding said aperture, said dam having a rim;
C. a flexible thimble composed of a resilient fluid-impervious material, the open end of which thimble comprises an external flange corresponding to and overlying the rim of said dam;
D. retainer ring means comprising (i) an internal flange member adapted to overlie said external flange of said flexible thimble, and (ii) locking means adapted to lockingly engage said dam and to maintain said external flange member of said flexible thimble in a fluid-sealing compressed state between said internal flange member and the rim of said dam.

3,928,743

ROCKER SWITCH WITH POSITION INDICATOR

Shigeo Ohashi, Tokyo, Japan, assignor to Nihon Kaiheiki Industrial Company, Ltd., Tokyo, Japan

Filed May 20, 1974, Ser. No. 471,691
Claims priority, application Japan, Nov. 12, 1973, 48-129831[U]
Int. Cl.² H01H 9/16
U.S. Cl. 200—308 7 Claims



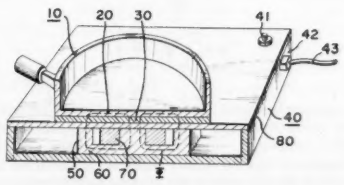
1. A rocker switch comprising a switch body, a rockable push-button mounted rotatably about an upper axis in said switch body, a contacts-actuating converter mounted rotatably about a lower axis in said switch body, said button and said converter being mutually connected by lug-and-recess engagement provided on said two members at a position intermediate between said upper and lower axis so that said two members are made to rotate mutually in reverse directions, an indicating window being provided centrally on the upper surface of said rockable push button, and a corresponding indicating surface being provided on the upper surface of said converter.

3,928,744

INDUCTION HEATING APPARATUS

Masahiro Hibino, Toyonaka, and Masatami Iwamoto, Itami, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 356,386, May 2, 1973, abandoned. This application Nov. 12, 1974, Ser. No. 523,113
Claims priority, application Japan, May 2, 1972, 47-44117; July 19, 1972, 47-72279; Nov. 8, 1972, 47-11873
Int. Cl.² H05B 5/04
U.S. Cl. 219—10.49 12 Claims



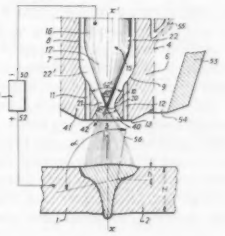
1. Induction heating apparatus comprising:
an iron core exciter having a cover plate and having an iron core excitation winding having a winding pitch for generating a low frequency alternating magnetic field,
a ferromagnetic element disposed adjacent to the exciter,
a non-magnetic high conductive element joined to the ferromagnetic element and interposed between the exciter and the ferromagnetic element and supported by the cover plate for the exciter to form a gap between the exciter and the high conductive element,
the iron core exciter generating alternating magnetic flux passing from the exciter through the high conductive element to the ferromagnetic element to inductively heat the high conductive element,
the excitation frequency being 60 Hz,
the gap being 5 mm,
the winding pitch being 80 mm, and
the high conductive element being copper with a thickness of 0.3 mm to achieve the maximum effective resistance.

3,928,745

METHOD OF ELECTRIC WELDING BY TRANSFERRED PLASMA AND A WELDING TORCH FOR CARRYING SAID METHOD INTO EFFECT

Paul Demars, Hazebrouck; Francis Cuny, Mantes-la-Jolie; Joseph Garrigoux, Laxou, and Christian Tassart, Brunoy, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed June 26, 1973, Ser. No. 373,899
Claims priority, application France, July 3, 1972, 72.23929
Int. Cl.² B23K 5/00
U.S. Cl. 219—121 P 4 Claims



1. A plasma welding torch with transferred arc, comprising a discharge nozzle for a plasma producing gas and a nonconsumable electrode disposed axially inside the discharge nozzle, said nozzle having in the direction of gas flow therethrough successively an axially convergent frusto-conical portion and an axially divergent frusto-conical portion the largest end of which constitutes the opening of said nozzle, said convergent and divergent portions of said nozzle meeting in a neck whose diameter is 2.5 mm. – 4 mm., said electrode having an extremity of conical form extending axially along said convergent portion and into said axially divergent portion of said nozzle a distance between 0.9 and 2 mm. from said neck.

3,928,746

DIRECT CURRENT POWER SUPPLY FOR MANUAL ARC WELDING

Rolf Ericsson, Laxa, Sweden, assignor to Elektriska Svetsningsaktiebolaget, Goteborg, Sweden

Filed Apr. 18, 1973, Ser. No. 352,445
Claims priority, application Sweden, Apr. 18, 1972, 4963/72
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² B23K 9/10
U.S. Cl. 219—135 10 Claims

1. A direct current power supply for manual arc welding having a steeply drooping, adjustable volt-ampere characteristic comprising
a polyphase transformer having a plurality of secondary output leads carrying mutually phase displaced voltages, a polyphase rectifier system connecting said secondary output leads to a pair of D.C. welding current conductors for supplying a direct current to a welding arc struck

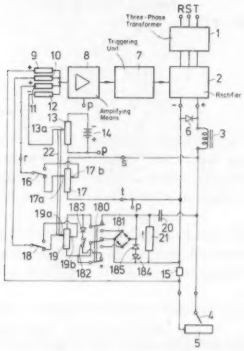
between a welding electrode and a workpiece, said polyphase rectifier system comprising a set of triggered rectifier valves connected one in series with each of said secondary output leads, said triggered rectifier valves having each a trigger terminal for initiating current flow through the valve,

means for periodically supplying igniting pulses to each of said trigger terminals, including means for causing the angular position of said pulses to vary in response to a direct current control signal,

means for generating said direct current control signal comprising the following means,

a. means for producing an adjustable direct current reference, signal, including manually operable means for adjusting said reference signal,

b. means including a welding current sensing means for producing a welding current feed-back D.C. signal equal to the welding current flowing in the pair of welding current conductors multiplied by a first factor of proportionality,



c. means including a welding voltage sensing means for producing a welding voltage feed-back D.C. signal equal to the voltage between the welding current conductors multiplied by a second factor of proportionality,

d. summing means for combining said reference signal, said welding current feed-back signal and said welding voltage feed-back signal into a compound signal constituting said control signal, both of said feed-back signals being supplied to said summing means in opposing relationship to said reference signal,

e. slope adjustment means comprising means for adjusting the proportion between said first and second factors of proportionality, and,

f. means linking said manually operable means for adjusting the reference signal and said proportion adjusting means to provide automatically a desired correlation between the slope of volt-ampere characteristic of the power supply and the reference signal setting.

3,928,747

THERMAL PRINTING APPARATUS

Ichiro Hanai, Ichikawa; Kazuo Takahashi, and Toshiharu Kobayashi, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 21, 1974, Ser. No. 444,571

Claims priority, application Japan, Feb. 23, 1973, 48-21955; Feb. 27, 1973, 48-23421; Nov. 27, 1973, 48-133274

Int. Cl.² H05B *1/00*

U.S. Cl. 219—216 **6 Claims**

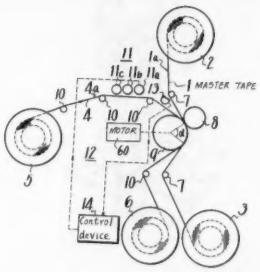
1. A thermal printing apparatus comprising:

a. means for transporting a master tape on which information is magnetically recorded;

b. means for transporting a slave tape;

c. means for bringing said master and slave tapes into contact with each other so as to print said information on said master tape onto said slave tape;

d. means for heating said slave tape to a temperature in the vicinity of the Curie point before said contact is made;



e. detecting means mounted between said heating means and said contacting means for detecting the temperature of said heated slave tape;

f. means for controlling the temperature of said heated slave tape as a function of the output of said temperature detecting means; and

g. in which said heating means is controlled by said control means by the output of said temperature detecting means.

3,928,748

COMBINED WINDOW HEATER AND ANTENNA

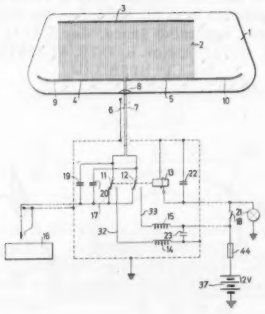
Gerd Sauer, Aachen-Laurensberg, Germany, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 20, 1974, Ser. No. 471,468

Claims priority, application France, Oct. 31, 1973, 73.38767

Int. Cl.² H05B *3/06*

U.S. Cl. 219—522 **2 Claims**



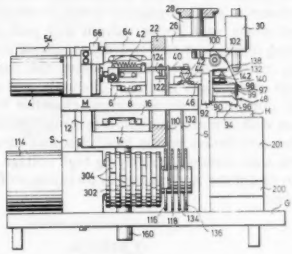
1. A windshield for automotive vehicles having a combined heater grid for heating said windshield at least within an area over which it is disposed and antenna for reception of frequency modulated radio signals of a frequency of the order of 100 megacycles, said windshield comprising a transparent substantially rectangular sheet, a plurality of electrically conductive resistive heating conductors supported on a surface of the sheet substantially parallel to one dimension thereof and spanning said area thereon smaller than but constituting a major fraction of the surface of said sheet, and three bus bands likewise supported on said sheet and extending at least in part

substantially parallel to the other dimension of said sheet, two of said bus bands being in spaced apart collinear relation and together with the other bus band connecting said conductors into a two-terminal circuit comprising said bus bands and conductors, each of said collinear bus bands including a portion extending beyond said area partly substantially collinearly with said bus band from which it extends and parallel to said other dimension and partly substantially parallel to said one dimension, said portions having a length substantially of the same order of magnitude as either of said dimensions, whereby said circuit may be tuned for the reception of frequency modulated signals of frequencies of the order of 100 megacycles, all parts of said combined heater grid and antenna being spaced from the edge of said sheet sufficiently to be outside the zone of influence of a vehicle body surrounding said sheet.

3,928,749
MACHINE FOR AUTOMATIC PRODUCTION OF SEMI-CONDUCTOR COMPONENTS

Eggert Herrmann, Waldpromenade 86, 8035 Gauting, Germany

Filed Oct. 9, 1974, Ser. No. 513,263
Claims priority, application Germany, Oct. 17, 1973, 2352113
Int. Cl.² B23K 1/00
U.S. Cl. 228—4.5 **28 Claims**

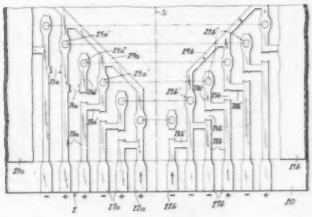


1. A machine for automatically attaching connecting wires at selected connection positions of a semi-conductor crystal and leadframe comprising a vertically adjustable working head, and horizontally movable means on said working head for applying connecting wires to the crystal and the leadframe, a first program-controlled drive device for moving the working head to preselected working points on the crystal, a second program-controlled drive device for moving the working head to preselected working points on the leadframe; and a crystal adjusting device for adjusting the relative lateral position of said crystal between the first drive device and the crystal, a lead-frame adjusting device for setting relative angular position of said leadframe between the first drive device and the crystal and between the second drive device and the leadframe, and program control means controlling the said drive devices, said program control means having numerical control means with fixed value reprogrammable memories.

3,928,750
CODE CARD AND DECODING NETWORK FOR ELECTRONIC IDENTIFICATION SYSTEM

Herbert Wölflingseder, Gartenstrasse 3, 7967 Bad Waldsee, Germany

Filed July 16, 1973, Ser. No. 379,712
Claims priority, application Germany, July 19, 1972, 2235274
Int. Cl.² G06K 7/06 19/06
U.S. Cl. 235—61.11 A **10 Claims**



1. A key card for the selective energization of a multiplicity of terminals of an electronic identification system with two different electric signal voltages, comprising:

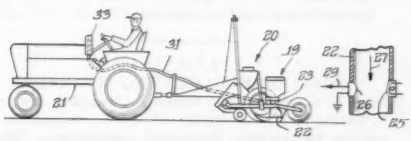
a flat dielectric body provided on opposite sides with respective conductor arrays each including an input lead and a multiplicity of output leads, a bus bar tied to said input lead, a first group of tabs directly connected to said bus bar, and a second group of tabs separated from said bus bar, the tabs of said first group on one of said sides registering with the tabs of said second group on the other of said sides and vice versa, the registering tabs being conductively interconnected through apertures in said body; and

selectively severable branch conductors in each of said arrays connecting each of said output leads to a respective tab of said first and said second group, thereby enabling exclusive energization of any output lead from either one of the input leads upon selective severance of one of its branch conductors.

3,928,751
SEED POPULATION MONITOR

George H. Fathauer, Decatur, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Aug. 19, 1971, Ser. No. 173,137
Int. Cl.² H03K 21/36
U.S. Cl. 235—92 PK **16 Claims**



1. A seed population monitor for a planter that simultaneously plants a multiplicity of rows of seeds, said monitor comprising sensing means for simultaneously sensing the number of seeds of each row being planted, a first counter responsive to said sensing means for determining a seed count in a row, a readout device for said first counter, a second counter, means for applying input pulses to said second counter as a function of distance traveled by said planter, circuit means associated with said second counter for automatically producing an output signal indicative of area when the planter travels an ascertained distance, and means responsive to said output signal for resetting the first counter and including means for

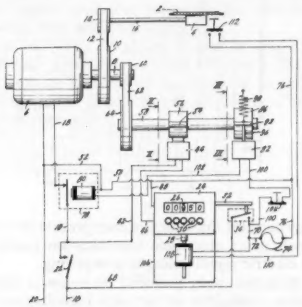
causing said readout device to provide a number that is a measure of the seed population per unit of area being planted over said ascertained distance.

3,928,752

BOBBIN MONITOR FOR SEWING MACHINES

Frank S. Darwin, 8838 Bluejacket Apt. 407, Overland Park, Kans. 66214

Filed Sept. 24, 1973, Ser. No. 399,818
Int. Cl. G06m *3/02*
U.S. Cl. 235—92 PD **6 Claims**



1. A monitor for indicating depletion of the bobbin thread of a sewing machine driven by an electric motor having an operating circuit including a treadle switch controlled by the machine operator and a source of electric power, said monitor comprising:

a. an electrically actuated signal device having an operating circuit including said signal device, said power source, and a normally open signal switch, but not said treadle switch,

b. a counter operable at and after a pre-determined reading thereof to actuate said signal device by closing said signal switch,

c. manually actuated reset means operable to reset said counter to a reading representing a full bobbin, whereby once actuated, said signal device remains actuated even when said treadle switch is opened, and until said counter is reset, and

d. driving means interconnecting said counter to a powered element of said sewing machine and operable to advance said counter at a rate proportional to the length of the stitch line being sewed, the reset and signal readings of said counter being so related that said signal device will be actuated when a pre-determined proportion of the bobbin thread has been exhausted.

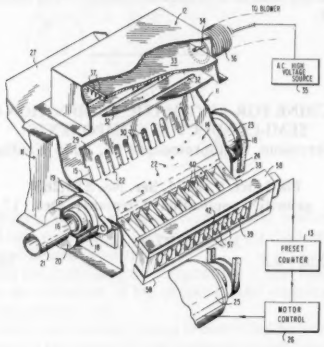
3,928,753

SMALL OBJECT COUNTING APPARATUS

William D. Kivett, Taylors; Robert J. Champion, and Jesse P. T. Harris, both of Greenville, all of S.C., assignors to Engineering Development Associates, Incorporated, Mauldin, S.C.

Filed Jan. 22, 1974, Ser. No. 435,499
Int. Cl.² G06M *3/00*
U.S. Cl. 235—92 PK **4 Claims**

1. An apparatus for counting large quantities of small objects with accuracy comprising an object infeed hopper, a horizontal axis object transport drum having plural spiral rows of suction ports mounted for rotation at the object discharge end of the hopper, means to turn the drum on its horizontal axis in one direction, means to create a partial vacuum in the drum during its rotation so that said suction ports may pick up objects from the hopper, an excess object rejection device fixedly mounted relative to the periphery of the drum and spaced from the hopper and allowing only one object to be transported by each suction port of the drum beyond said device, an object pick-off member fixedly mounted at the side of the drum remote from the hopper and spaced from said device and having inclined object guidance channels corresponding in number to the number of suction ports in each spiral row on said drum, said pick-off member removing objects from said suction ports with a scraping action during rotation of the drum and causing such objects to slide through said channels, electro-optical object sensors on the pick-off member adjacent to each channel thereof responding to the sequential passage of objects through the channels and producing sequential electrical pulses representative of the number of objects passing through the channels, counter means electrically coupled to said electro-optical sensors for totalizing the number of objects sequentially passing through all of said channels until a present count is obtained, means arranged above said hopper, drum and pick-off member for directing ionized air downwardly to agitate and clean objects resting in the hopper and for aiding the passage of objects through said object guidance channels, and said last-named means comprising an ionization chamber having a slotted bottom wall, a metal plate having a multiplicity of dependent needles positioned within said chamber above said slotted bottom wall, means for applying high voltage alternating current to said plate, and means for directing air forcibly into said chamber.

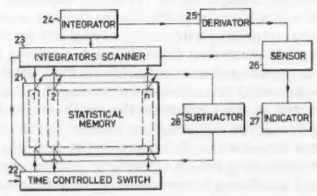


3,928,754

DEVICE FOR CALCULATING THE RESONANT ROLLING PERIOD OF A SHIP

Herman Allan Friedrich Edlund, Kolstorp, S-610 24 Vikbolandet, Sweden

Filed May 3, 1974, Ser. No. 466,855
Claims priority, application Sweden, May 7, 1973, 7306342
Int. Cl.² B63B *43/06*; G06F *15/50*
U.S. Cl. 235—150.2 **5 Claims**



1. A device for ascertaining the most prevalent rolling period of a ship, including a pulse generator responsive to rolling to generate a train of pulses, each of which has a predeter-

mined time relationship with the rolling motion in which it occurs, the interval between successive pulses representing the rolling period, a statistical memory having different storage locations corresponding respectively to different values of rolling period, a timer responsive to each new pulse from the pulse generator to start a new timing cycle and to enter a signal into the storage location corresponding to the duration of the period terminated by that pulse, an output scanner for scanning the storage locations to derive signals representing the number of entries in the different storage locations, and a maximum signal sensor responsive to the signals from the output scanner for ascertaining the storage location in which the most signals have been entered.

3,928,755
LOW PASS NONRECUSINE DIGITAL FILTER

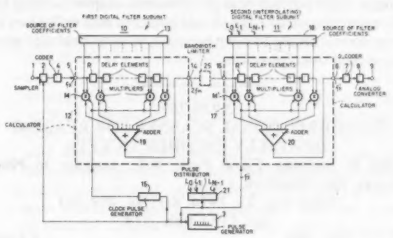
Maurice Georges Bellanger, Antony; Guy Pierre Lepagnol, Sceaux, and Jacques Lucien Daguet, Saint-Maur-des-Fosses, all of France, assignors to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Jan. 24, 1974, Ser. No. 436,392

Claims priority, application France, Jan. 25, 1973, 73.02584

Int. Cl.² G06F *15/34*

U.S. Cl. 235—152 **2 Claims**



1. A digital filter for filtering a series of first binary code words occuring at a first sampling frequency f_e, and for producing a filtered version of the first words occuring at another sampling frequency f'_e, comprising: at least one first digital filter subunit having an input terminal, an output terminal and a first cut-off frequency which is smaller than f_e; means to apply said series of first words to the input terminal of the first filter subunit, at least one interpolation digital filter subunit having an input terminal, an output terminal and a second cut-off frequency which is smaller than f'_e; each subunit including a source of filter coefficients, means for providing a weighted sum of a predetermined series of words with a corresponding series of the filter coefficients, and a clock pulse generator; the pulse generator in the first subunit operating at a frequency which exceeds the first cut-off frequency to provide at the output terminal of the first subunit a series of second code words occuring at a sampling frequency exceeding said first cut-off frequency and constituting a version of said first words; means to apply said second code words to the input terminal of said interpolation filter subunit; and the pulse generator in the interpolation filter subunit operating at the desired sampling frequency f'_e.

3,928,756
DEVICE FOR CALCULATING THE SUCCESSIVE DERIVATIVES OF A FUNCTION OF A VARIABLE

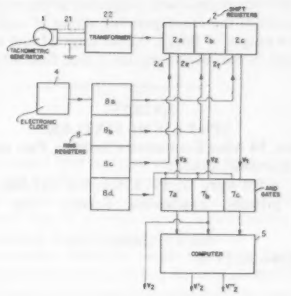
Didier Auray, 4 Rue des Tartres, 92500 Rueil-Malmaison, France

Filed Jan. 16, 1974, Ser. No. 433,897

Claims priority, application France, Jan. 17, 1973, 73.01520; Oct. 8, 1973, 73.35895; Nov. 21, 1973, 73.41916

Int. Cl.² G06G *7/18*

U.S. Cl. 235—183 **5 Claims**



1. A device for calculating the successive derivatives of a function of a variable, especially for regulating or controlling said function, comprising: for calculating the n first derivatives, means for sensing in succession the function values for $(n+p)$ successive values of the variable, n and p designating two integers, storage means for memorizing the sensed $(n+p)$ values of said function, and computing circuits fed from said storage means and adapted to determine the values of the n first derivatives according to known mathematical formulas; said computing circuits being adapted to determine the value of the nth derivative of the function y of variable x according to the following formula:

$$\frac{d^n y}{dx^n} = \frac{1}{k\,\overline{\Delta x}^n} \sum_{i=0}^{i=n} a_i\, y\,(x_i + i\,\Delta x),$$

k being a constant factor, Δx a predetermined algebric increment of the variable x, and a_i mathematically calculable coefficients, depending each on the respective value of integer index i; for calculating the acceleration dV/dt of a moving body at a time t, and its variation d^2V/dt^2, said computing circuits being adapted to determine the values of:

$$\frac{dV}{dt} = \frac{V(t+\Delta t) - V(t-\Delta t)}{2\,\Delta t}, \text{ and}$$

$$\frac{d^2V}{dt^2} = \frac{V(t+\Delta t) - 2\,V(t) + V(t-\Delta t)}{\overline{\Delta t}^2},$$

Δt being a predetermined time interval; for calculating the derivatives of a function of time at regularly spaced time intervals, said storage means essentially comprising a shift or displacement memory, having at least one input connected to the output of said sensing means, and a plurality of outputs stepped in the direction of shift or displacement of said memory, said memory outputs being connected to the corresponding inputs of said computing circuits; said memory being a shift register having at least one shift control input, connected to an electronic clock; first AND gates having each a first and

a second input, said first AND gates being respectively inserted through their respective first inputs between the outputs of said shift register and the corresponding inputs of said computing circuits, and means for transmitting a transfer pulse to the second inputs of said first AND gates at a time not earlier than the moment when said shift register is filled; for calculating the n first derivatives of a function of time, said device comprising a shift register having $(n+1)$ stages connected in series, and a ring register having $(n+2)$ stages, the input of the first stage of said ring register being connected to said electronic clock, whereas the outputs of the $(n+1)$ first stages of said ring register are connected to the respective shift control inputs of the corresponding stages of said shift register, and the output of the $(n+2)$th stage of said ring register is connected to the second inputs of said first AND gates.

3,928,757

SPOT LIGHT FIXTURE

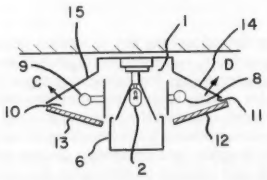
Paul Nelson, 34 Allee Emmanuel Chabrier, Parc du Roy d'Espagne, Marseille, France

Filed Apr. 17, 1973, Ser. No. 351,844

Claims priority, application France, May 26, 1972, 72.19622

Int. Cl. H05b *33/02*

U.S. Cl. 240—51.11 R **2 Claims**



1. An overhead lighting fixture comprising, in combination, a housing provided with a first pair of laterally spaced elongated casings and a second central elongated casing,

a pair of parallel coextensive fluorescent lamp tubes respectively supported within said first pair of casings,

means including a separate reflector below each tube to provide for directing the light therefrom at an angle to the ceiling, the directed light having vertical and oppositely directed lateral components away from the first pair of respective casings,

a pair of incandescent spotlight lamps within the elongated central casing and spaced therealong,

means supporting one of said spotlight lamps in said elongated central casing to project the light therefrom without obstruction in a downwardly vertical direction, and

means supporting the other of said spotlight lamps in said elongated central casing for projecting the light therefrom without obstruction in an oblique direction both downwardly and toward the one spotlight.

3,928,758

FLOODLIGHT

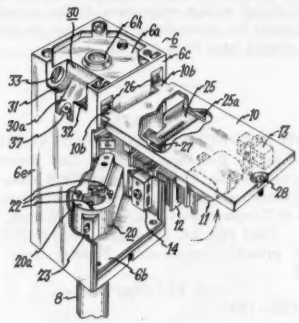
Mitchell M. Osteen, Zirconia, and Myron D. Martin, East Flat Rock, both of N.C., assignors to General Electric Company, N.Y.

Filed Apr. 27, 1972, Ser. No. 247,958

Int. Cl.² F21S *1/00*

U.S. Cl. 240—73 R **2 Claims**

1. A lighting fixture comprising, in combination, an optical housing adapted to contain lamp means, combined ballast housing and fixture support means separate from and attached to said optical housing, said combined housing and support means comprising top, bottom and a plurality of side walls, said bottom wall formed with an aperture adapted to receive a supporting post, one of said side walls having an opening therein, an access door hingedly connected to said one side wall for swinging movement between a closed position covering said opening therein and an open position away from said opening to provide access to the interior of said combined housing and support means, electrical ballast means for operating the lamp means mounted on the inner side of said access door, and combined door support and locking means secured to said access door and co-acting with an adjacent one of said



side walls for holding said access door in open position, said combined door support and locking means comprising an arm member secured at one end to said access door projecting inwardly therefrom and being normally urged in yieldable engagement with said adjacent side wall, said arm member having a catch portion near its other end adapted to snap over and engage the outer edge of said adjacent side wall when said access door is swung to open position, so as to hold said access door in said open position.

3,928,759

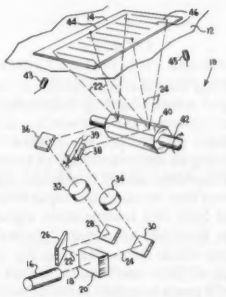
OMNIDIRECTIONAL SCANNER FOR READING DIGITALLY ENCODED TICKETS

Ronald P. Sansone, Floral Park, N.Y., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Aug. 22, 1974, Ser. No. 499,463

Int. Cl.² G06K *7/14*

U.S. Cl. 250—568 **8 Claims**



1. In a method for producing a scan pattern on the window of a check-out stand for the reading of bar codes, the steps comprising:

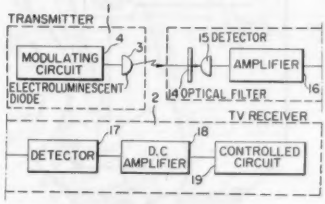
A. directing a beam of light toward the window to produce a longitudinally extending scan across the window; and

B. simultaneously directing a second beam of light toward the window to produce a plurality of scans on the window which are substantially at a right angle to the longitudinally extending scan.

3,928,760
REMOTE CONTROL SYSTEM

Mikio Isoda, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 316.459, Dec. 19, 1972, abandoned.
This application May 7, 1974, Ser. No. 467,664
Claims priority, application Japan, Dec. 27, 1971, 46-3559
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 6 Claims



1. A remote control system for performing a control function by way of a transmission path exposed to ambient light, comprising

A. a transmitter assembled within a compact casing, said transmitter including

a. an electroluminescent diode for emitting, when energized, a remote control light signal having a relatively narrow spectral width by way of said transmission path;

b. circuit means connected to said diode for energizing said diode at a predetermined ultrasonic frequency said circuit means consisting of an oscillator means comprising an oscillator circuit for oscillating at said predetermined frequency rate, and means for energizing said diode with the output of said oscillator means whereby said remote control light signal is alternately energized and de-energized at said predetermined frequency rate;

c. an electric power source connected to said diode and said circuit means for supplying a low DC voltage thereto to actuate said diode and said circuit means circuit, and

d. a light reflector means mounted around said diode for effectively directing said remote control light emitter from said diode to a desired target; and

B. a receiver spaced apart from said transmitter for receiving said light signal by way of said transmission path, said receiver including

e. a light receiving means for receiving said remote control light signal transmitted from said transmitter,

f. a transducing means for detecting said received light signal and for converting a detected light signal into an electric signal by means of a photoelectric detector,

g. an amplifier means consisting of a narrow-band tuning amplifier connected to said transducing means for amplifying said converted electric signal, and for selecting only a signal component of frequency in the ultrasonic region from the light signal transmitted from said diode in the transmitter,

h. a detector means connected to said amplifier means for detecting said ultrasonic frequency component and for providing a detector output signal, and

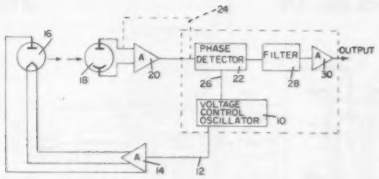
i. a means connected to the output of said detector means for performing a control function in response to said detector output signal;

whereby spurious ambient light noises received by said receiver from said transmission path are reduced to eliminate any spurious control which may arise from ambient light.

3,928,761
PHOTOELECTRIC APPARATUS EMPLOYING PHASE LOCKED LOOP CIRCUITS

Francis P. Dunigan, 143 Lovell Road, Holden, Mass. 01520

Filed Apr. 15, 1974, Ser. No. 460,748
Int. Cl.² G01J 1/32
U.S. Cl. 250—205 9 Claims



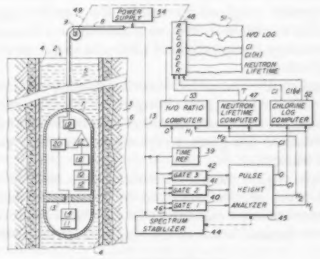
1. Phase locked loop in signal emitting circuit comprising an oscillator, said oscillator being connected to an optical signal emitting device, a signal receiving device, means for translating the signal into an electric signal, a connection from said signal translating means to a phase detector,

and a connection from the oscillator to the phase detector, said phase detector providing an output signal only upon receiving an electric wave form emanating from the signal receiving device and from the oscillator which wave forms are substantially the same.

3,928,762
PULSED NEUTRON COMBINATION WELL LOGGING SYSTEM

Harold E. Peelman, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed May 6, 1974, Ser. No. 467,029
Int. Cl. G01v 5/00
U.S. Cl. 250—270 20 Claims



1. A method for logging a well borehole to obtain direct indications of the hydrocarbon bearing earth strata penetrated thereby, comprising the steps of:

passing a well tool having a pulsed source of fast neutrons and a radiation detector longitudinally spaced therefrom through a well borehole;

repetitively irradiating the earth formations in the vicinity of the borehole with bursts of fast neutrons;

detecting, subsequent to said neutron bursts, gamma radiations attributable to the capture of neutrons by elemental hydrogen and oxygen in the vicinity of the borehole and generating signals representative thereof;

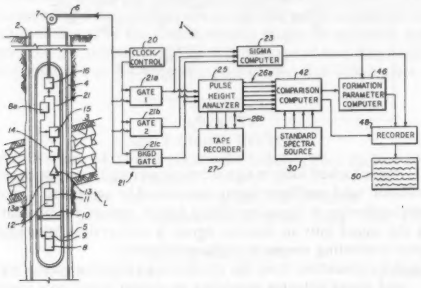
forming a ratio signal representative of the ratio of said signals representative of elemental hydrogen and oxygen in the vicinity of the well borehole; and

recording said representative ratio signal as a function of the borehole depth of said well tool.

3,928,763
MEASUREMENT OF SUBSURFACE FORMATION LITHOLOGY, INCLUDING SHALINESS, USING CAPTURE GAMMA SPECTROSCOPY

Hubert D. Scott, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 12, 1974, Ser. No. 531,941
Int. Cl.² G01V 5/00
U.S. Cl. 250—270 **10 Claims**



1. A method for analysis of earth formations surrounding a well borehole wherein the macroscopic thermal neutron capture cross-section of the formations is known, comprising the steps of:

a. obtaining standard gamma ray energy spectra of materials postulated to be in formations surrounding a well borehole;

b. bombarding the earth formations in the vicinity of the borehole with fast neutrons which are slowed down and thereafter engage in neutron capture reactions with materials in the vicinity of the borehole;

c. obtaining gamma ray energy spectra of unknown materials surrounding the well borehole;

d. comparing an unknown gamma ray spectrum with a composite weighted mixture of the standard gamma ray spectra to obtain therefrom a quantitative measure of the percentage composition of elements in the vicinity of the borehole;

e. based on the quantitative measurement obtained in said step of comparing, obtaining a partial macroscopic thermal neutron capture cross section of the elements contributing to the gamma rays of the unknown gamma ray spectrum; and

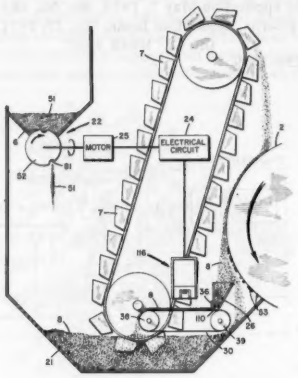
f. comparing the partial macroscopic thermal neutron capture cross section obtained to the known macroscopic thermal neutron capture cross section of the formation to obtain an indication of the shaliness of the formation.

3,928,764
METHOD AND APPARATUS FOR MEASURING AND CONTROLLING THE TONER CONCENTRATION IN ELECTROPHOTOGRAPHIC REPRODUCTION MACHINES

Hartmut Bock, Fischbach, Taunus, and Hans Götte, Kelkheim, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Germany

Filed June 4, 1973, Ser. No. 366,510
Claims priority, application Germany, June 2, 1972, 2226924
Int. Cl. G01n 23/12, 23/20
U.S. Cl. 250—272 **11 Claims**

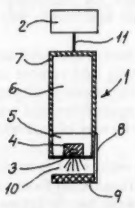
1. A method of measuring the toner concentration of a developer containing toner circulating in an electrophotographic reproduction machine, comprising forming a horizontal layer of developer of constant thickness from the circulating developer for measurement, passing said layer past a source of β-rays that are effected by the toner, irradiating the layer by β-rays and measuring the β-rays being scattered back from said irradiation to determine the amount of toner present.



3,928,765
DETERMINING COMPOSITION OF A SUBSTANCE BY THE USE OF BOTH REFLECTED AND TRANSMITTED RADIATION

Steen Teller, Allerod, Denmark, assignor to Isotopcentralen, Copenhagen, Denmark

Filed Nov. 19, 1973, Ser. No. 417,407
Claims priority, application Denmark, Nov. 22, 1972, 5819/72
Int. Cl. G01n 23/00
U.S. Cl. 250—272 **6 Claims**



1. Apparatus for the determination of the content of at least one chemical element in a medium by an electromagnetic radiation method by the detection of backscattered and transmitted radiation, the apparatus comprising:

at least one first radiation source arranged on one side of a test zone;

at least one detecting means including a recording means, said detecting means being arranged on the same side of the test zone as said first radiation source; and

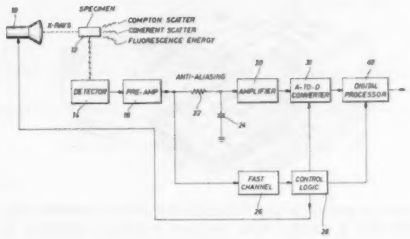
at least one second electromagnetic radiation source located at a side of said test zone opposite said detecting means;

said detecting means being adapted to detect both radiation emitted from said first radiation source and backscattered in the test zone and radiation emitted from said second radiation source and transmitted through the test zone.

3,928,766
HIGH SPEED PULSE PROCESSING

Kermit D. Clausen, and John R. Rhodes, both of Austin, Tex., assignors to Columbia Scientific Industries, Inc., Austin, Tex.

Filed Aug. 6, 1973, Ser. No. 386,100
Int. Cl.² G21K *1/00*
U.S. Cl. 250—273 **11 Claims**



1. Method of processing energy charges from an energy-dispersive detector to determine the amplitude values of said charges, the detector operating in an emission spectroscopy system wherein a specimen under analysis is illuminated by a pulsable source capable of exciting characteristic X-rays, which comprises:

detecting a first energy charge with a long time constant circuit, the output therefrom being a first substantially linear decay;

sampling the amplitude value of said first linear decay and converting said sample value to digital form;

creating a second energy charge for detection by the detector by pulsing on said source, the output from the detector being a second substantially linear decay;

at a measurable time thereafter, sampling the amplitude value of said second linear decay and converting said sampled value to digital form;

digitally projecting along the slope of said first linear decay the amplitude value at the time of the sampling of said second linear decay; and

subtracting the value of said projected first linear decay from said sampled second linear decay to determine the relative amplitude value of said first and second decays.

3,928,767
APPARATUS FOR USE IN THE DETERMINATION OF FOCAL SPOT SIZE IN X-RAY TUBES

Werner Wilhelm Roeck, 41 Conlins Road, West Hill, Ontario, Canada

Filed Nov. 18, 1974, Ser. No. 524,922
Claims priority, application United Kingdom, Nov. 20, 1973, 53751/73
Int. Cl.² G03B *5/17*
U.S. Cl. 250—320 **6 Claims**

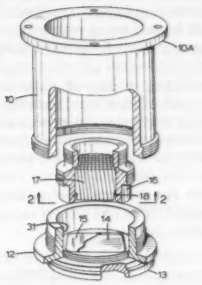
1. In an apparatus for use in the determination of focal spot size in X-ray tubes, means for determining the position of the central beam comprising:

a lens structure, said lens structure defining a pair of parallel upper and lower planes each providing a regular pattern of markings of distinctive opacity to X-rays, each pattern defining an array of discrete position coordinates in the respective plane, each array being the projection of the other in a direction perpendicular to said planes,

means for assembling a photographic film in close proximity to the lower plane at a predetermined orientation relative thereto, and

means for locating the assembly with respect to an X-ray tube so that the central beam impinges perpendicularly on said upper plane,

whereby to derive a composite photographic image of said patterns of markings in which the image components

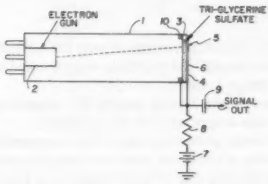


corresponding to the respective patterns coincide at the position of the central beam.

3,928,768
THERMAL IMAGING TUBE HAVING A PYROELECTRIC TARGET AND ANNULAR POTENTIAL STABILIZING ELECTRODE

Merton H. Crowell, Mahopac, N.Y., assignor to North American Philips Corporation, New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,373
Int. Cl.² H01J *31/49*
U.S. Cl. 250—333 **2 Claims**



1. A thermal imaging tube comprising an evacuated envelope, an electron gun within said envelope for producing an electron beam, a thermally responsive target of pyroelectric material positioned at one end of said tube to receive said electron beam on one surface thereof and a thermal image on the opposite face thereof for producing a potential image corresponding to said thermal image which can be scanned by said electron beam, an annular conductive member encircling the periphery of said target on the side facing the electron beam, means to apply a potential to said target at which said beam lands on said target, and means to apply a potential to said annular member which is not greater than the potential applied to the target and at which positive electrical charge build-up at the periphery of said target is prevented and said target is capable of being polled from an external source.

3,928,769
LAMINOGRAPHIC INSTRUMENT

Webster D. Smith, Lomita, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Mar. 19, 1973, Ser. No. 342,489
Int. Cl. G03b *41/16*
U.S. Cl. 250—445 T **9 Claims**

1. A laminographic instrument comprising:

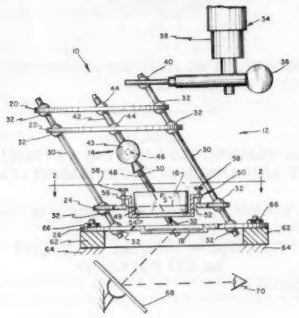
an articulated support including four frames disposed one over the other, connecting bars extending between and spaced about said frames, and swivel connections joining said frames and bars;

the swivel connections for each frame having their swivel centers located in a common swivel center plane, the swivel connections of each bar having swivel centers located on a common swivel center axis, the swivel center planes of said frames being parallel to one another, and the swivel center axes of the bars being parallel to one another;

said frames including a pair of radiator support frames adjacent one end of said bars, an image frame adjacent the other end of said bars, and a specimen frame between said support frames and said image frame;

a radiation source having a radiation axis parallel to swivel center axes;

a pair of swivel connections joining said source to said radiator support frames and having swivel centers located on said radiation axis;



said radiation source including means for emitting a beam of radiation along said radiation axis toward said specimen and image frames;

said specimen frame having means for supporting on said radiation axis a specimen to be examined;

said image frame including means for supporting on said radiation axis a radiation sensitive imaging medium;

means for mounting one of said frames in a fixed position, whereby said latter frame is a relatively fixed frame and said support may be driven in an oscillatory motion about the swivel connections of said fixed frame to produce on said imaging medium a shadow image which represents only the cross-section of said specimen located in the swivel center plane of said specimen frame; and

drive means connected to said support for oscillating said support about the swivel connections of said fixed frame.

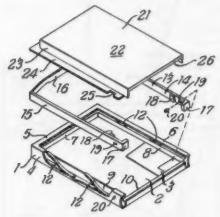
3,928,770

FILM CASSETTE

George Frederick Albert Marriott Turner, Ilford, England, assignor to Ilford Limited, England

Filed Aug. 19, 1974, Ser. No. 498,541
Int. Cl.[2] G03C 5/16
U.S. Cl. 250—481 11 Claims

1. An X-ray film cassette which comprises (a) a rectangular base member consisting of a flat base plate which has on three sides upstanding walls having thereon inwardly directed horizontal flanges, (b) a cover member held in position on the base member which consists of a flat plate which has on three sides upstanding walls having thereon outwardly directed horizontal flanges, the dimension of both the base member and the cover member being so chosen that the flanges on the cover member can slide under the flanges on the base member to hold the cover member in the base member, (c) resilient means located between the base plate of the base member and the horizontal flanges of the cover member for holding the cover member in the raised position so that the horizontal flanges on the cover member abut the horizontal flanges on the base member, (d) means located in the base member enabling the cover member to be held with its flanges adjacent to the base plate of the base member when the cover member is pushed down against the resilient means to enable the cassette to be closed, (e) means for releasing the cover member



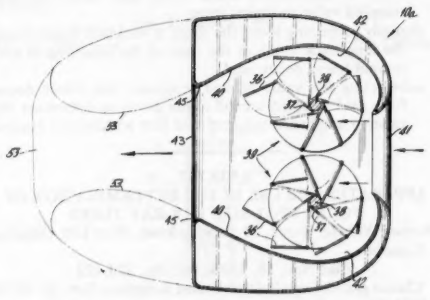
so that it can return to the raised position, (f) means for rendering light-tight the side of the cassette which is not covered by an upstanding wall on the base member and (g) means for retaining an X-ray film firmly in position in the cassette when the cassette is in the closed position.

3,928,771

WATER CURRENT POWER GENERATOR SYSTEM

O. Robert Straumsnes, One Bryant Crescent, White Plains, N.Y. 10602

Filed Apr. 5, 1974, Ser. No. 458,228
Int. Cl.[2] F03B 13/10
U.S. Cl. 290—43 2 Claims



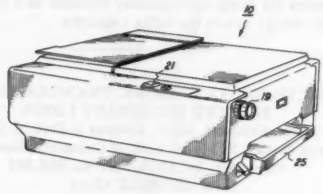
1. In a water current power generator system including power generating means, the combination comprising:

a ship having an inlet and an outlet for the passage of water therethrough, a pair of water wheels mounted vertically within said inlet and in a juxtaposed position, each of said water wheels having a plurality of blades pivotally mounted and spaced about the periphery of said wheel, and a plurality of fixed radially extending members integrally formed about the axis of said water wheel wherein the blades pivot against said fixed radially extending members to form a rigid member as they encounter the water flow adjacent to the inlet and then pivot outwardly therefrom to minimize water resistance as the blades return to the inlet position, and, means coupling the water wheel to the power generator means.

3,928,772
TIME DEPENDENT FAULT DETECTOR

Thomas J. Mooney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 14, 1974, Ser. No. 450,959
Int. Cl.² G03G *15/00*
U.S. Cl. 307—116 **4 Claims**

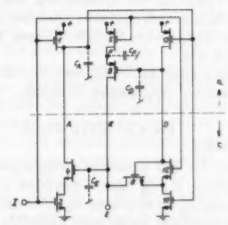


1. In combination with a xerographic copier having a plurality of mutually exclusive routines each alloted a different amount of time, a time dependent fault detector for interrupting the operation of said copier whenever any one of said routines fails to be completed within the time alloted thereto; said detector comprising a timing capacitor, a resistive path for supplying charging current for said capacitor, a shunt path coupled in parallel with said capacitor for bypassing said charging current around said capacitor until one of said routines is initiated, means responsive to the initiation of any one of said routines for disabling said shunt path to thereby trigger said timer into operation, and means for selectively bypassing a portion of the resistance in said path to thereby adjust the time out period of said timer to match the time alloted to said one routine.

3,928,773
LOGICAL CIRCUIT WITH FIELD EFFECT TRANSISTORS

Henri J. Oguey, Peseux, and Eric André Vittoz, Cernier, both of Switzerland, assignors to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Continuation of Ser. No. 308,586, Nov. 21, 1972, abandoned. This application Apr. 9, 1974, Ser. No. 459,425
Claims priority, application Switzerland, Nov. 22, 1971, 16966/71
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl.² H03K *19/08, 19/20, 23/00*
U.S. Cl. 307—225 C **2 Claims**

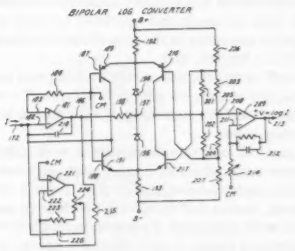


1. A binary frequency divider stage circuit with insulated gate field effect transistors (MOST) powered by a constant voltage source, comprising an input I for introducing an input signal and at least three logical nodes, each logical node being an interconnection between the drains of at least one n-channel MOST and at least one p-channel MOST, each logical node being connected to control means of at least one other node and being able to be used as an output, the source of one of the MOST (1) of at least one of the nodes (A) being connected to one terminal of the voltage source and the source of the other MOST (A) of the same node being connected to the drain of a third MOST (2), the source of which is connected to the other terminal of the voltage source, the node (A) establishing the interconnection between the drains of the p- and n-channel MOST being controlled by two variables, one being the input signal and the other being the signal from an other logical node (E), in such a way that one variable (I) drives the gates of the third MOST (2) and one p-channel MOST, and the other variable drives the gate of the n-channel MOST (4), allowing the corresponding node to float when this transistor (4) as well as the complementary transistor (1) driven by the other variable are both blocked.

3,928,774
BIPOLAR LOG CONVERTER

Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation

Division of Ser. No. 436,250, Jan. 24, 1974, Pat. No. 3,855,101. This application Aug. 5, 1974, Ser. No. 494,443
Int. Cl.² G06G *7/12, 7/24*
U.S. Cl. 307—229 **16 Claims**



1. A bipolar log converter comprising

a. a differential input amplifier having one input receiving a bidirectional current signal and another input connected to circuit common of a DC power supply means, and an output providing a voltage representative of said current signal;

b. a pair of transistors comprising PNP and NPN types with their bases at circuit common and their collectors connected to said input of said differential input amplifier receiving the current signal;

c. a voltage biasing network for providing a current flow from said DC power supply means through the collector-emitter junctions of said transistors thereby placing said transistors into a conducting condition for nonlinear potential-current conversion;

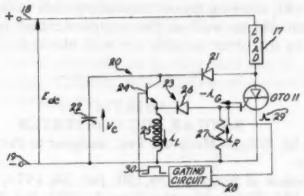
d. a pair of diodes series connected between the emitters of said transistors and at the common junction of said diodes connected to the output of said differential input amplifier thereby forming a feedback loop wherein said current signal is passed through one of said collector-emitter junctions and a diode to the output of said differential input amplifier for creating a potential; and

e. means for providing from said potential a continuous potential signal representing the current signal whereby said potential signal has a polarity representative of the flow direction of the current signal and a magnitude representative of the logarithm of the current signal, and said potential signal changing polarity upon a change in flow direction of the current signal.

3,928,775
TURN-OFF CIRCUIT FOR GATE TURN-OFF THYRISTORS AND TRANSISTORS USING SNUBBER ENERGY

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 20, 1974, Ser. No. 481,147
Int. Cl.² H03K *17/60*
U.S. Cl. 307—252 C **6 Claims**



1. A semiconductor device turn-off circuit comprising

a power semiconductor device having a pair of load terminals and a control terminal for controlling switching of said device between a conducting state and a non-conducting state blocking voltage,

a polarized snubber circuit comprising a series-connected snubber diode and snubber capacitor connected between said load terminals and operative to store energy in said snubber capacitor as the rate of rise of voltage across said device is limited, and

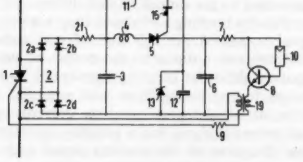
a turn-off circuit for selectively utilizing said stored snubber capacitor energy to generate a turn-off control current pulse to achieve switching of said device to the nonconducting state,

said turn-off circuit comprising a controlled solid state switch and inductive energy storage means connected across said snubber capacitor to form a series resonant circuit, means for rendering conductive said controlled solid state switch for a predetermined interval to transfer said stored energy to said inductive energy storage means, said inductive energy storage means and a series-connected blocking diode being coupled between said control terminal and one load terminal such that discharge of said inductive energy storage means forward biases said blocking diode and generates said turn-off pulse, and an impedance connected between said control terminal and one load terminal for circulating excess energy.

3,928,776
ARRANGEMENT FOR CONTROLLING A THYRISTOR

Gerd Thiele, Erlangen-Frauenaurach, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 29, 1974, Ser. No. 528,492
Claims priority, application Germany, Dec. 4, 1973, 2360392; Dec. 20, 1973, 2363617
Int. Cl.² H03K *17/60*
U.S. Cl. 307—252 N **9 Claims**



1. An arrangement for controlling a thyristor in which a series circuit consisting of a charging diode and a storage capacitor is coupled in parallel to the thyristor with the storage capacitor shunted by a series circuit comprising a switching device and a firing capacitor and with means provided for coupling the firing capacitor to the control electrode of the thyristor, the improvement comprising:

a. a switching device in the form of an auxiliary thyristor;

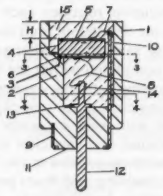
b. a choke in the series circuit shunted across the storage capacitor; and

c. means for firing said auxiliary thyristor as a function of the voltage across the firing capacitor.

3,928,777
DIRECTIONAL ULTRASONIC TRANSDUCER WITH REDUCED SECONDARY LOBES

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, both of Cohasset, Mass.

Filed Aug. 26, 1974, Ser. No. 500,391
Int. Cl.² H01L *41/04*
U.S. Cl. 310—8.2 **5 Claims**



1. In combination in a directional electroacoustic transducer, a housing structure having an opening, a polarized ceramic disc characterized in that its periphery is smaller than the periphery of said opening, and further characterized in that it operates at a frequency near its planar resonant vibrational mode, said ceramic disc includes a vibratile surface, means for locating said ceramic disc within said opening in said housing structure with said vibratile surface placed opposite said opening, means for reducing the amplitude of the secondary lobes in the directional pattern of said transducer, said means including a sound conducting material located within said opening and making intimate contact with said vibratile surface.

3,928,778
DEVICE FOR THE PRECISION DISPLACEMENT OF AN ARTICLE WITHIN A PLANE

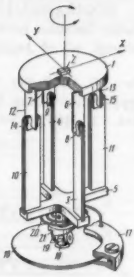
Evgeny Alexandrovich Ivanov, Berezovaya alleya, 3, kv. 65; Vladislava Venediktovna Silchenkova, korpus 214, kv. 24; Alexandr Afanasievich Sazonov, ploschad Junosti 4, kv. 48, and Nikolai Stefanovich Budkin, korpus 117, kv. 4, all of Moscow, U.S.S.R.

Filed June 21, 1974, Ser. No. 481,846
Claims priority, application U.S.S.R., June 26, 1973, 1936988
Int. Cl.² H01L *41/08*
U.S. Cl. 310—8.3 **1 Claim**

1. A device for the precision orientation of articles in a plane, comprising: a ring base; a platform; a coordinate table for accommodating an article being oriented; and a piezoelectric electromechanical transducer assembly operatively connecting said platform to said coordinate table, said piezoelectric electromechanical transducer assembly comprising a plurality of piezoelectric plates, each plate having first and second ends, first of said piezoelectric plates being arranged in one plane and displacable along one coordinate for moving an article along the one coordinate,

second of said piezoelectric plates being arranged in a plane perpendicular to said one plane of the first of the plates and displacable along a second coordinate for moving said article along the second coordinate, flat springs, each

corresponding to each of said piezoelectric plates and connecting the first end of the corresponding piezoelectric plate with said coordinate table, the plane of said flat springs each being perpendicular to said corresponding



piezoelectric plates; and a third piezoelectric plate, said third piezoelectric plate being connected to said ring base, a screw pair coupling said third plate with said platform, said second ends of said piezoelectric plates being rigidly secured to said platform.

3,928,779

EXCITATION WINDING ARRANGEMENT FOR A SALIENT POLE ELECTRIC MACHINE

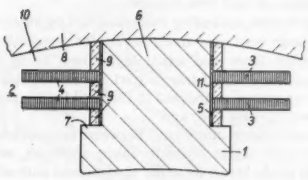
Gunter Zwarg, and Paul Kirchner, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 14, 1974, Ser. No. 442,685

Claims priority, application Germany, Feb. 19, 1973, 2308541

Int. Cl.² H02K *3/00*

U.S. Cl. 319—194 **1 Claim**



1. In an electrical machine having a plurality of salient poles, each of the poles including an insulated pole shank, an excitation winding arrangement comprising; a plurality of individual disc-like coils, each of said coils being wound of a flat conductor, the conductor being wound on its flat side in a single layer in the form of a disc-like member having a plurality of mutually insulated turns one next to the other; insulating compound means impregnating said coil and hardened to impart to said member an inner strength sufficient to make the same a self-supporting component; said coils being apportioned into a plurality of groups of coils corresponding to respective ones of the poles, the coils of each of said groups being mounted on the insulated pole shank corresponding thereto so as to be tightly fitted thereon in spaced relation from each other, each of said coils being disposed with respect to the pole shank so as to extend outwardly in free space substantially in a plane perpendicular to the shank wall so as to cause the flat sides of the conductor to extend parallel to the shank wall, each of said coils having top and bottom surfaces likewise extending perpendicular to the shank wall; and, spacer means lying directly next to corresponding ones of the pole shanks for spacing said coils in free space and from each other, said spacer means being in contact with said coils only close in at the wall of the pole shank whereby said spacer means covers only a small fraction of said coil surfaces, said coils of each group being arranged into a plurality of coil pairs, each of said pairs being spaced from each other as well as from the yoke and the pole shoe, the coils of each pair having respective end-face surfaces juxtaposed, said insulating compound being confined to the spaces between each two mutually adjacent turns of the coils of each pair and between said juxtaposed surfaces whereby each of the coils of each coil pair has an uncovered outwardly facing end-face perpendicular to said pole shank.

3,928,780

ANGULAR VELOCITY DETECROT ARRANGEMENT FOR A VEHICLE WHEEL, PARTICULARLY FOR AN ANTI-SKID BRAKE SYSTEM

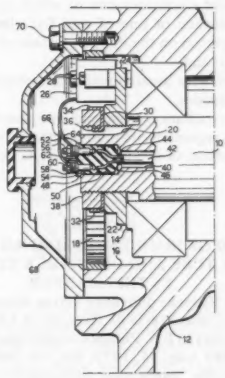
Paolo Vannini, turin; Luigi Anselmino, and Giuseppe Frazzini, both of Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed June 25, 1974, Ser. No. 482,944

Claims priority, application Italy, June 25, 1973, 68883/73

Int. Cl.² H02K *21/38*

U.S. Cl. 310—168 **3 Claims**

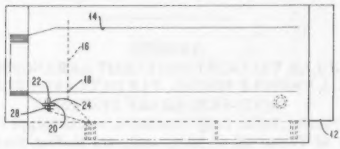


1. In an angular velocity detector assembly for a vehicle wheel having a hub mounted on an axle by inner and outer bearings, the outer bearing of which is secured in position by a nut threaded on the end of said axle, said detector assembly comprising a toothed wheel fixed to the vehicle wheel and a fixed electromagnetic pick-up device cooperating magnetically with said toothed wheel, the improvement comprising said pick-up device being supported by said nut which secures said outer bearing for said vehicle wheel on said axle, a threaded bush having a locking washer securing said nut in position on said axle, said toothed wheel being carried directly on said hub of said vehicle wheel concentric with said axle and disposed radially outwardly of said pick-up device for cooperation with said pick-up, an axial bore in said axle, a plug of elastomer material incorporating two terminal connectors, said plug being housed in said bore in said axle, a cable having two leads extending through said bore in said axle and output leads from said pick-up, said leads being connected to said two terminals in said plugs of elastomeric material.

3,928,781
GASEOUS DISCHARGE DISPLAY PANEL INCLUDING PILOT ELECTRODES AND RADIOACTIVE WIRE

Roger Joseph Edwards, Woodstock; Barouyr Zareh Hairabedian, Lake Katrine, and Neil Myron Poley, Kingston, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,268
Int. Cl.² H01J 17/32, 61/54
U.S. Cl. 313—54 4 Claims



1. In a plasma display device comprising a panel with an illuminable gas sealed in a chamber between two substantially transparent flat plates, said chamber containing a multiplicity of light emitting cells wherein each cell is formed at a cross-over point of spaced orthogonal conductors, such that the gas in the region of each coordinate intersection of said conductors may be fired in response to a firing potential difference applied to said orthogonal conductors, the improvement comprising

a pair of pilot electrodes one of which is disposed on the interior surface of one of said flat plates, the other of which is placed on the interior surface of the other of said flat plates, and

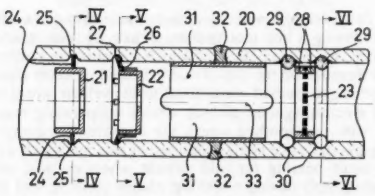
a radioactive wire located within the chamber between the pilot electrodes,

whereby the radiation from said wire aids the ionization of gas in the region of said pilot electrodes which in turn aids in the ignition of the illuminable gas cells of the display panel.

3,928,782
METHOD OF MANUFACTURING AN ELECTRIC DISCHARGE TUBE AND DISCHARGE TUBE OBTAINED IN THIS MANNER

Johannes van Esdonk; Johannes Petrus Hornman, and Franciscus Cupertinus Maria de Hass, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 14, 1973, Ser. No. 388,255
Claims priority, application Netherlands, Sept. 27, 1972, 7213022
Int. Cl.² H01J 1/88, 19/42
U.S. Cl. 313—249 3 Claims

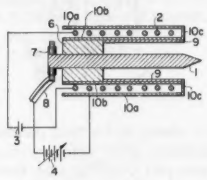


1. A method of manufacturing an electric discharge tube having a plurality of recesses in its inner wall for holding supporting parts of the electrode system of the tube, comprising the steps of: fixing into the tube relative to a reference point a mask having openings corresponding to the shape and mutual displacement of the recesses to be created, and exposing the uncovered wall portions of the tube to the action of a jet of particles of grinding material incorporated in a fluid until the recesses are created.

3,928,783
THERMIONIC CATHODE HEATED BY ELECTRON BOMBARDMENT

Shigeru Hosoki; Michio Ohtsuka, both of Hachioji, and Satoru Fukuhara, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 10, 1973, Ser. No. 423,107
Claims priority, application Japan, Dec. 8, 1972, 47-122502
Int. Cl.² H01J 1/94, 1/20
U.S. Cl. 313—270 13 Claims



1. A thermionic cathode structure comprising:

a cathode made of a material having a high electron emissivity;

a supporter made of an electrically-insulating and high temperature-resistant material for supporting a part of said cathode;

a first cylinder held in contact with said supporter and arranged so as to surround a part of said cathode;

a second cylinder arranged concentrically with said first cylinder;

a cathode heating coil arranged in an interstitial space between said first and second cylinders;

an electron-emissive metal oxide layer formed on an inside surface of said first cylinder;

flange means, extending from said first cylinder toward said cathode past said oxide layer, for preventing electrons emitted from said oxide layer from being mixed with electrons emitted from a part of said cathode;

a power source connected to said coil for supplying heating power to said coil; and

a power source connected between said cathode and said first cylinder in order to cause electrons, emitted from said oxide layer, to strike against said cathode.

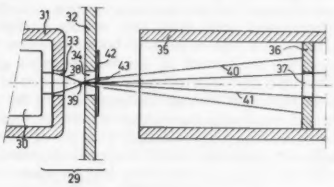
3,928,784
TELEVISION CAMERA TUBE WITH CONTROL DIAPHRAGM

Willem Paul Weijland, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 267,001, June 28, 1972, abandoned.
This application Apr. 15, 1974, Ser. No. 461,008
Claims priority, application Netherlands, July 2, 1971, 7109170
Int. Cl.² H01J 29/56, 31/38
U.S. Cl. 313—389 2 Claims

1. A television camera tube comprising an electrically conductive transparent layer, a layer of photoconductive material on said electrically conductive layer on which a potential distribution is formed corresponding to an optical image projected thereon through said electrically conductive transparent layer, an electron gun spaced from said photoconductive layer for producing an electron beam for scanning the surface and periodically reducing said potential distribution to cathode potential of said photoconductive layer remote from said electrically conductive layer, said electron gun having a cathode, a grid and an anode, said grid and anode each having an aperture 0.6 mm therein and being spaced apart 0.25 mm for

forming an electron beam having a cross-over therebetween, said anode having a second aperture diameter at the area of the smallest cross-section is a maximum of 0.150 mm and a minimum equal to the electron beam diameter at said area for intercepting returning electrons from the photoconductive layer whereby the beam cross-over formed between the cathode and anode can serve as the object to be reproduced, a



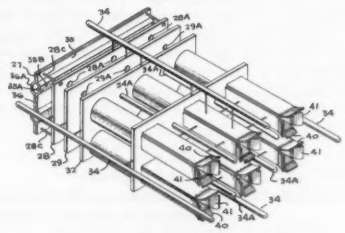
hollow cylindrical electrode between said anode and said photoconductive layer, and a diaphragm in said hollow cylindrical electrode having an aperture the diameter of which at the area of the smallest cross-section is a maximum of 10% of the distance between the aperture in the anode and the aperture in the diaphragm said aperture diaphragm distance being 12 mm, and the cathode-grid distance being 0.1. mm.

3,928,785

SINGLE GUN, MULTI-SCREEN, MULTI-BEAM, MULTI-OLOR CATHODE RAY TUBE

Adrian W. Standaart, 5 Bonbrook Circle, Winston-Salem, N.C. 27106

Filed Nov. 23, 1971, Ser. No. 201,460
Int. Cl.² H01J *29/50, 31/20*
U.S. Cl. 313—411 **14 Claims**



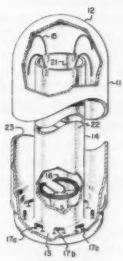
1. A single gun, multi-screen, multi-beam, multi-color cathode ray tube construction for producing visible images comprising a glass envelope including a neck portion and a faceplate portion, said faceplate portion having a plurality of individual phosphor screens arranged serially along a reference axis in at least one rectilinear row over the area of said faceplate portion, each said screen being adapted to produce an image for direct viewing, upon electron-activation of the phosphors, a single electron gun within said neck portion for producing a plurality of electron beams at least equalling in number the number of screens, said electron gun including a single cathode having a narrow elongated flat strip surface for each said row with its longitudinal center axis paralleling said reference axis and lying in a transverse plane transversely spanning the cathode and facing the screens, a coating of electron emission material on said flat strip surface which is thermally activated to emit electrons for forming the electron beams, control grid and first anode elements in spaced planes paralleling the plane of said flat strip surface and each comprising a single planiform non-conductive panel member each having a hole for each of the respective electron beams lined with conductive material for controlling and shaping the electrons emitted by the cathode into the beams, the holes in said grid and first anode elements for each respective electron beam being axially alined along a beam axis substantially perpendicular to said strip surface, said cathode comprising a pair of metallic sheet members joined along a common plane transverse and perpendicular to said beam axis, each having outwardly projectin truncated V-shaped channel formations collectively defining a six-sided channel of substantially honeycomb configuration in cross-section with one side paralleling said common plane forming said strip surface and alined respectively with said holes in said control grid and anode elements, the channel housing filament wire along the length thereof in a coil concentric with the axis of the channel and closed adjacent the walls thereof, and accelerating anode means for accelerating the electrons in said beams toward said phosphor screens, said cathode, grid and anode elements being rigidly supported in a unitary assembly.

3,928,786

FLUORESCENT LAMP HAVING PARTITIONED VAPOR DISCHARGE

John H. Campbell, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 375,656, July 2, 1973, abandoned. This application Oct. 21, 1974, Ser. No. 516,459
Int. Cl.² H01J *61/35, 61/42*
U.S. Cl. 313—493 **5 Claims**



1. A fluorescent lamp comprising a partition member, means providing ultraviolet-producing vapor discharge paths at opposite sides of said partition member, and phosphor at only one side of said partition member, said partition member being of ultraviolet-transmitting material so that said phosphor can be excited by ultraviolet radiation from both of said vapor discharge paths.

3,928,787

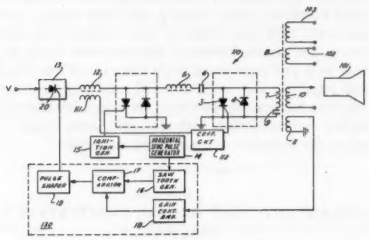
ENERGY STABILIZATION IN A HORIZONTAL DEFLECTION CIRCUIT FOR A TELEVISION RECEIVER

Erich Geiger, Friesen, Germany, assignor to Loewe-Opta GmbH, Kronach, Germany

Filed Nov. 9, 1973, Ser. No. 414,389
Claims priority, application Germany, Nov. 11, 1972, 2255389
Int. Cl.² H01J *29/70*
U.S. Cl. 315—403 **6 Claims**

1. In a deflection circuit having a repetitive sweep cycle including a first relatively short flyback interval and a second relatively long forward sweep interval wherein the circuit comprises, in combination, a first storage capacitor coupled between a supply inductor and the primary winding of a deflection transformer, first means for coupling the input of the inductor to a source of operating voltage whereby an oscillatory energy interchange occurs between the operating voltage source and the output of the deflection circuit via the inductance and the first storage capacitor, and a first thyratron-like

gating means associated with the inductor, the switching time of the first gating means being varied in dependence on changes in the quantity of energy in such oscillatory energy interchange, the improvement wherein the first gating means is serially connected between the source of operating voltage and the input of the inductor, and wherein the circuit further comprises, in combination, first means for generating, during each first interval, an output control pulse of substantially



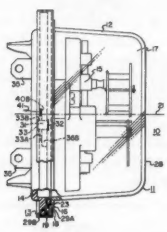
fixed duration whose time of occurrence relative to the start of the associated first interval is proportional to the voltage stored on the first capacitor at the start of such first interval, and second means for coupling the output of the first generating means to the control electrode of the first gating means, whereby the time of occurrence of the output control pulse is automatically adjusted to maintain a constant dynamic current-voltage ratio at the output of the deflection transformer.

3,928,788

TAMPER PROOF WATTHOUR METER ENCLOSURE

Gerald W. Finnen, Raleigh, and Herman Q. Wilson, Clayton, both of N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 3, 1974, Ser. No. 485,675
Int. Cl.² H02B 9/00
U.S. Cl. 317—111 **3 Claims**



1. A tamper proof watthour meter enclosure comprising:

a base assembly supporting a watthour meter movement, said assembly including circularly arcuate attachment lugs extending radially at the outer periphery thereof in spaced apart relationship, said attachment lugs having forward and rear side radial surfaces thereon;

a cup-shaped cover including a closed forward end and an open rear end, said cover further including a circular mounting flange extending radially outward at said rear open end, with a rear radial side surface mating with said front radial side surfaces of said attachment lugs, said cover further including a locking rim carrying tab members rotationally attaching and locking said cover to said attachment lugs to enclose said watthour meter movement within a protective enclosure chamber; and

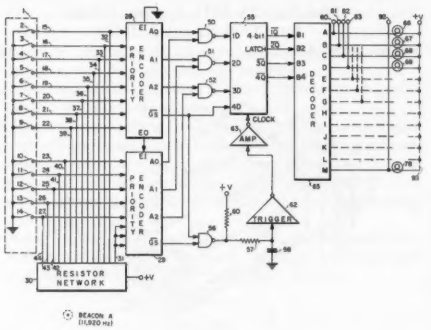
a permanent locking arrangement including a clip member, a first groove formed in the front side surface of one of said attachment lugs, a second groove formed in said rear side surface of said mounting flange of said cover, a slot extends from the side of said first groove, said second groove being in a facing relationship with said first groove, said first and second grooves and said slot defining an enclosed space wholly containing said clip member, said clip member being made of an integral piece of resilient sheet material and including a substantially flat elongated bottom portion supported on the bottom of said first groove, a tab extending from said bottom portion and into said slot and an arm projection extending at a predetermined angle from said bottom portion and terminating at a free edge, said bottom portion being supported on the bottom of the base assembly groove such that said free edge of said arm projection is positioned in alignment with an abutment end of the cover groove and engageable therewith to oppose movement of said cover in an opposite direction to said one direction, and said arm projection being resiliently depressible by said rear side surface of said cover into the space of said first groove during rotational attachment of said cover to said base assembly so as to thereafter resiliently return to the locking position within the space of said second groove upon said grooves being mutually aligned in the facing relationship.

3,928,789

SWITCH INTERLOCK CIRCUIT

Jack Elias, Lansdale, Pa., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 13, 1973, Ser. No. 397,153
Int. Cl.² G06F 3/02
U.S. Cl. 317—136 **8 Claims**



1. A keyboard interlock circuit comprising:

a keyboard having a plurality of manually actuable switches, supply means connected to said switches to provide a separate switch output signal from each of said switches with each switch output signal being representative of an actuation of a respective one of said switches,

encoding means connected to said switches for coding each of said output signals from said switches to a respective coded representation thereof, said encoding means including priority determining means for restricting said coded representation from said encoding means to represent a switch output signal having the highest priority among concurrently applied switch output signals from said switches to said encoding means,

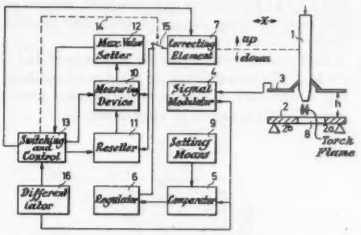
means for decoding said coded representation from said encoding means into an energization of a mutually exclusive one of a plurality of output lines from said means for decoding, and

output means connected to said output lines to respond to a selective energization of said output lines by said means for decoding.

3,928,790
REGULATING PROCESS AND DEVICE

Karl Heinz Schmall, Baden-Baden, Germany, assignor to Precitec GmbH, Baden-Baden, Germany

Filed June 11, 1974, Ser. No. 478,278
Claims priority, application Germany, June 16, 1973, 2330782
Int. Cl.² B23Q 17/18; G05D 3/04
U.S. Cl. 318—286 **11 Claims**

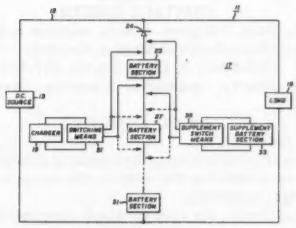


1. A regulating process for the carrying out the process for maintaining substantially constant the distance of a tool from a work piece to be processed having an uneven surface over which the tool is moved parallel to the surface, particularly for the distance regulation of the torch of a torch-cutting device from the work piece, the tool distance being determined by a sensing element, compared with the desired factor and the thus-determined deviation fed to a regulator, which, depending on this, emits regulating signals to a correcting element, which shifts the tool toward the work piece or away from the work piece, depending on the direction of the deviation, characterized in that in the initiation of a movement of the correcting element directed toward the work piece, the course of the tool to the correcting element is accumulatively determined, that the accumulated value is compared with the predetermined maximum factor, on exceeding the predetermined maximum factor, the tool is stopped and then is moved by in accordance with the predetermined maximum factor again away from the work piece and is maintained in this position until the sensing element determines a decrease of the distance between tool and work piece.

3,928,791
STAND-BY POWER SYSTEM

Ferdinand H. Mullersman, Gainsville, Fla., assignor to General Electric Company, Columbus, Ohio

Filed May 20, 1974, Ser. No. 471,594
Int. Cl.² H02J 7/00
U.S. Cl. 320—7 **11 Claims**



1. A battery charging apparatus for a high voltage stand-by power system, said system comprising a power source connected in circuit with a load and a battery of rechargeable cells coupled across said load to provide stand-by power upon the non-functioning of said source, said battery being divisible into a plurality of sections of at least one cell each for charging, and a supplemental battery section, said apparatus comprising:

a. charging means for supplying a source of charging current;

b. switching means, coupled between said charging means and each of said plurality of sections, for sequentially switching said plurality of sections, one section at a time, to said charging means for charging, said switching means comprising:

1. a plurality of circuit paths for electrically connecting said charging means in circuit with each of said sections;
2. current control means in said circuit paths for controlling the transmission of current from said charger to each of said sections; and
3. first control section means for activating said current control means to sequentially transmit said current to said sections, one at a time; and

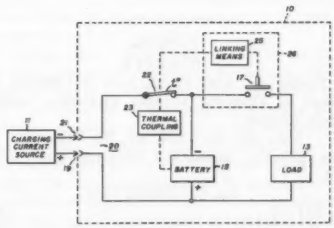
c. a supplemental switching means, coupled between said supplemental battery section and said battery, for automatically, electrically connecting said supplemental battery section in circuit with said battery when one of said sections is being charged, said supplemental switching means comprising:

1. a plurality of supplemental circuit paths for connecting said supplemental section to each of said battery sections;
2. supplemental current control means in said supplemental circuit paths for controlling the conductivity of said circuit paths;
3. second control section means for activating said supplemental current control means to sequentially connect said supplemental section in parallel with each of said battery sections, one section at a time; and
4. third control section means for activating said supplemental current control means to disconnect each of said sections from said battery and from said supplemental section.

3,928,792
METHOD OF RESETTING THERMOSTAT USED WITH TEMPERATURE CONTROLLED CHARGING

Ferdinand Henry Mullersman, and James Edward Sarisky, both of Gainesville, Fla., assignors to General Electric Company, Columbus, Ohio

Filed Feb. 24, 1975, Ser. No. 552,289
Int. Cl.² H02J 7/04
U.S. Cl. 320—35 **8 Claims**



1. A battery-operated apparatus comprising:

a. an electrically operable load;

b. a rechargeable battery for energizing said load,

c. temperature-actuated switch means, thermally coupled to battery, said switch having first and second positions, said switch automatically shifting from said first to said second position responsive tc an increase of the temperature of said battery above a predetermined level;

d. a switch mechanism for simultaneously energizing said load and for resetting said temperature-actuated switch to said first position.

3,928,793

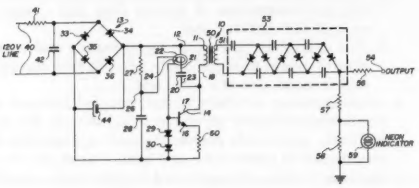
POWER SUPPLY CIRCUIT WITH ELECTRO-MAGNETIC FEEDBACK

Douglas G. Waltz, Garland, Tex., assignor to Varo Semiconductor, Inc., Garland, Tex.

Filed July 31, 1974, Ser. No. 493,247

Int. Cl.² H02M *3/315*

U.S. Cl. 321—2 **10 Claims**



1. In a power supply for providing an operating voltage to an electric utilization means, the combination comprising: inductance means having a first and a second lead, said first lead extending therefrom for receiving DC current of a first value; a switchable circuit including solid state switching means having load electrodes connected to said second lead of said inductance means to be in series therewith, said solid state switching means further including a control electrode; capacitor means having a pair of electrical leads extending therefrom and connected in circuit with the leads of said inductance means to form a resonant circuit therewith, said switchable circuit providing a current path to initiate oscillation of said resonant circuit; feedback means electro-magnetically coupled to at least one of the leads of said inductance means and to said capacitor means to sense circulating current flow therethrough, said feedback means being coupled to said control electrode of said solid state switching means to cause said inductance means, capacitor means and said solid state switching means to function as an oscillator, said feedback means being responsive to the amplitude of oscillation from said oscillator to disable said oscillator when reduced circulating current is sensed between said inductance and capacitor means by said feedback means; and rectifier means coupled to said inductance means to provide a DC voltage of a second value to an output terminal thereof to be delivered to the electric utilization means.

3,928,794

INVERTER

Anders Broms, and Kjell Frank, both of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 25, 1974, Ser. No. 518,148

Claims priority, application Sweden, Nov. 26, 1973, 7315941

Int. Cl.² H02M *7/00*

U.S. Cl. 321—5 **6 Claims**

1. Inverter comprising at least one connection group (A), each connection group comprising

a. a first positive (P1) and a first negative (N1) point of connection for connection to a feeding direct voltage source (T1–T6),

b. an alternating current terminal (*a*),

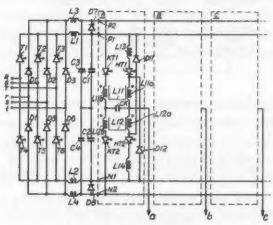
c. a first controllable main rectifier (HT1) connected between said positive point of connection (P1) and the alternating current terminal (*a*) and a second controllable main rectifier (HT2) connected between said alternating current terminal (*a*) and the negative point of connection (N1),

d. a commutating capacitor (CK), one terminal of which is connected to the alternating current terminal (*a*),

e. a second positive (P2) and a second negative (N2) point of connection for connection to a commutating direct voltage source (D1–D6),

f. a first controllable commutating rectifier (KT1) connected between said second positive point of connection (P2) and the second terminal of the commutating capacitor (CK), and a second controllable commutating rectifier (KT2) connected between said second terminal of the commutating capacitor and said second negative point of connection (N2),

g. a first and a second pair of windings (L11*a*, L11*b* and L12*a*, L12*b*, respectively), each pair of windings comprising a first and a second winding, said windings being magnetically coupled to each other,



h. a first and a second feedback valve (D11,D12),

in which the first pair of windings has its first winding (L11*a*) connected between the first main rectifier (HT1) and the alternating current terminal (*a*) and its second winding (L11*b*) in series with the first commutating rectifier (KT1),

the second pair of windings has its first winding (L12*a*) connected between the alternating current terminal (*a*) and the second main rectifier (HT2) and its second winding (L12*b*) in series with the second commutating rectifier (KT2),

the first feedback valve (D11) has its anode connected to a point between the second main rectifier (HT2) and the first winding (L12*a*) of the second pair of windings, and its cathode connected to the first positive point of connection (P1), and that

the second feedback valve (D12) has its anode connected to the first negative point of connection (N1) and its cathode to a point between the first main rectifier (HT1) and the first winding (L11*a*) of the first pair of windings.

3,928,795

CONTACT TESTER

Robert Lechner, Feldgasse, Austria, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 6, 1974, Ser. No. 467,154

Claims priority, application Germany, May 7, 1973, 2322961

Int. Cl.² G01R *31/02*

U.S. Cl. 324—28 CR **3 Claims**

1. A tester for determining the operating condition of switch contacts by measuring the transfer resistance thereof with a low voltage, comprising:

a bridge circuit, the arms of which comprise, respectively, the contacts being tested, a first reference resistor, the latter being connected through first coupling contacts and second coupling contacts,

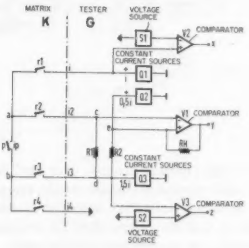
a first constant-current source having a positive terminal connected to a first terminal of said contacts being tested over third coupling contacts,

fourth coupling contacts connecting a second terminal of said contacts being tested to ground,

second reference resistor for supplying a reference voltage to said first reference resistor,

second constant-current source having a positive output terminal connected to a first terminal of said second reference resistor and a terminal of said bridge circuit formed by a first junction point connecting said first reference resistor and said second coupling contacts,

third constant-current source having a negative terminal connected to said first junction point, said third constant-current source being constructed to supply as much current as said first and second constant-current sources combined,



first threshold voltage source,

first comparator means having one input connected to said first junction point and another input connected to an output of said first threshold voltage source,

second comparator means having an input connected to said first terminal of said second reference resistor and another input connected to a second junction point of said bridge circuit connecting said first coupling contacts and said first reference resistor,

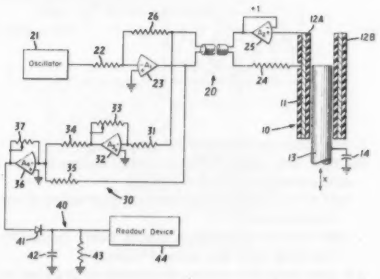
second threshold voltage source, and

third comparator means having an input connected to said second threshold voltage source and another input connected to said positive output of said first constant-current source.

3,928,796
CAPACITIVE DISPLACEMENT TRANSDUCER

Willard D. Kaiser, Grove City, Ohio, assignor to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Nov. 30, 1973, Ser. No. 420,556
Int. Cl.² G01R 27/26
U.S. Cl. 324—61 R **1 Claim**



1. Apparatus for measuring the displacement of a moveable rod of a machine, comprising:

a conductive sleeve located over at least a part of the rod;

a resistance having one end connected to said conductive sleeve;

an operational amplifier with its output connected to the other end of said resistance and its noninverting input connected to a reference ground;

an input resistor with one end connected to the inverting input of said amplifier;

a source of a.c. voltage connected to the other end of said input resistor;

a feedback resistor with one end connected to the inverting input of said amplifier;

means for connecting said conductive sleeve to the other end of said feedback resistor;

means for coupling said rod to the reference ground;

means for obtaining an a.c. signal equal to the a.c. voltage drop across said resistance;

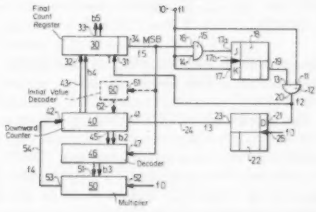
means for demodulating the a.c. signal; and

means for measuring the demodulated signal.

3,928,797
CIRCUIT FOR CONVERTING A FREQUENCY INTO A BINARY NUMBER

Uwe Kiencke, Moglingen, and Günter Hönig, Braunschweig, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed June 25, 1974, Ser. No. 482,831
Claims priority, application Germany, July 14, 1973, 2336015
Int. Cl.² G01R 23/02
U.S. Cl. 324—78 D **8 Claims**



1. Circuit for converting a frequency into a binary number in response to a sequence of pulses of said frequency and to a sequence of clock pulses of a much higher frequency comprising:

downward binary number counting means (**40**) arranged to be initially set and reset at a maximum count number by a reset signal and to count downwards from said number in response to counting pulses;

count timing means responsive to said clock pulses for providing said counting means a count-versus-time characteristic that is substantially hyperbolic for a predetermined period of its downcounting operation, said count timing means being dependent on the momentary count output of said counting means and including

decoding means (**46**) for detecting the values of count at which the counting rate should be reduced by a predetermined amount for provision of said hyperbolic characteristic and for generating a modifying signal determining a factor by which the frequency of said clock pulses is reducible;

multiplying means (**50**) for reducing the frequency of said clock pulses by said factor in response to said clock pulses and said modifying signal and for producing counting pulses for said counting means;

registering means (**30**) for receiving the momentary count value in said counting means after counting down from said maximum count number for a predetermined integral number of periods of said frequency

to be measured and for holding said count value for readout thereafter for at least one period of said frequency to be measured, and

resetting means (22) for providing a reset signal to said counting means after a count value is received as aforesaid by said registering means.

3,928,798

MEANS FOR FREQUENCY/DIGITAL CONVERSION

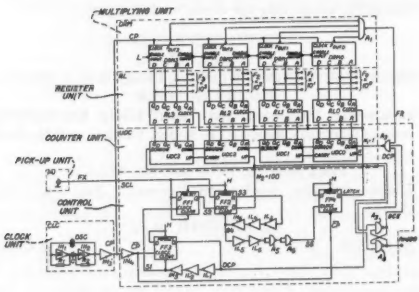
Jaroslav Valis, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 7, 1974, Ser. No. 512,624

Claims priority, application Sweden, Nov. 22, 1973, 7315792

Int. Cl.² G01R 23/02

U.S. Cl. 324—78 D **5 Claims**



1. Apparatus from frequency/digital conversion, especially for digital revolution and speed measuring, which comprises a clock unit (CLC), a control unit (SCL), and a counter unit (UDC), the clock unit (CLC) including means to deliver a first pulse train (CP) with a constant frequency (f_C), in which the apparatus comprises a multiplying unit (DRM) including means to deliver to the control unit a second pulse train (FR), the frequency of which (f_R) is dependent on the product of said constant frequency (f_C) and the latest maximum value (F) of the contents (G) of the counter unit (UDC),

the counter unit (UDC) including means to reduce its contents (G) by a first quantity (N_1) in response to each pulse in the second pulse train (FR), another unit (PU) including means to supply the control unit (SCL) with a third pulse train (FX) with an unknown frequency (f_X),

the control unit (SCL) including means to emit a control signal to the counter unit (UDC) for each pulse in the third pulse train, the counter unit (UDC) increasing its contents (G) by a second quantity (N_2) at the occurrence of said control signal, said second quantity (N_2) being greater than or equal to said first quantity (N_1), and after each such addition the contents (G) of the counter unit (UDC) having reached a new maximum value (F) which constitutes a digital representation of the frequency (f_X) of the second pulse train (FX).

3,928,799

AUTOMATIC BALANCING DC COMPARATOR VOLTMETER

Norbert L. Kusters, and Malcolm P. MacMartin, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

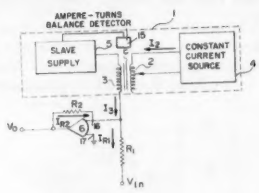
Filed May 20, 1974, Ser. No. 471,482

Int. Cl.² G01R 17/06

U.S. Cl. 324—99 D **13 Claims**

1. Apparatus for measuring a dc potential comprising:

a. a self-balancing direct current comparator having a primary circuit, a secondary circuit, and means for detecting ampere-turns balance between the primary and secondary circuits; said primary circuit including a primary winding having an adjustable number of turns N_2 wound on a magnetic core and current means to provide a constant current I_2 through said primary winding, said secondary circuit including a secondary winding having N_3 turns wound on said magnetic core and current means controlled by said ampere-turns balance detector means to provide a direct current I_3 through said secondary winding to maintain ampereturns balance between said windings, such that $I_2 N_2 = I_3 N_3$;



b. first resistor means having first and second terminal means, said second terminal means coupled to said secondary winding, said first terminal means adapted to be coupled to said dc potential to be measured to generate a current I_{R1} in the resistor means; and

c. further detector means coupled to said second terminal means to generate a voltage V_o when $I_3 \quad I_{R1}$, such that said dc potential to be measured is directly related to the turns N_2 of said primary winding when the voltage $V_o = 0$.

3,928,800

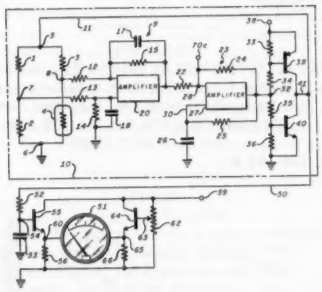
CALORIMETRIC RESISTANCE BRIDGES

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation, New York, N.Y.

Filed June 25, 1973, Ser. No. 373,574

Int. Cl.² G01R 5/22, 21/04

U.S. Cl. 324—106 **6 Claims**



1. Measurement apparatus comprising:

multiple arm bridge circuit means having in one arm first and second impedance means,

said first impedance means being sensitive to an effect to be measured,

said second impedance means being cyclically variable between first and second values,

low pass amplifier means responsive to the state of balance of said bridge circuit means,

feed back means responsive to said low pass amplifier means for resetting the balance of said bridge circuit means,

display means,

synchronizer means for cyclically switching said second impedance means between said first and second values,

said synchronizer means being further adapted synchronously to couple and decouple capacitive means responsive to said low pass amplifier means to said display means.

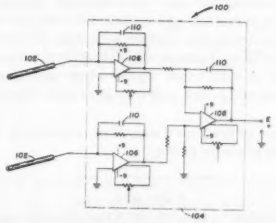
3,928,801
METHOD AND APPARATUS FOR SENSING RATE OF ANGULAR DISPLACEMENT

Maynard L. Hill, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 301,363, Oct. 27, 1972, Pat. No. 3,868,074. This application Nov. 15, 1974, Ser. No. 524,335

Int. Cl.² G01P *3/42*; G01R *5/28*

U.S. Cl. 324—160 **3 Claims**



1. A method for sensing the rate of angular displacement of an object about an axis taken through the object, the object being disposed within the static electric field existing in the earth's atmosphere, the method comprising the steps of:

disposing at least two electrically conductive members on the object about the aforesaid axis, the members being electrically connected; and,

sensing the current flowing between the conductive members on displacement of the object,

converting said sensed current from said conductive members into a voltage signal proportional to the rate of angular displacement of the object about the aforesaid axis.

3,928,802
AXLE GENERATOR DEVICE HAVING DEFLECTABLE STATOR

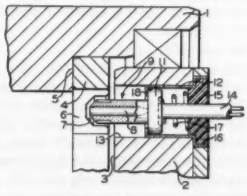
Erich Reinecke, Beinhorn, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed May 24, 1974, Ser. No. 473,140

Claims priority, application Germany, Aug. 10, 1973, 2340585

Int. Cl.² G01P *3/48*; H02K *19/24*

U.S. Cl. 324—174 **3 Claims**



1. A speed signal generator device for providing output pulses corresponding in frequency to the angular velocity of a rotating member comprising:

a. a stator mounted on the axle of the rotating member and having a magnetic flux field;

b. a rotor mounted on the rotating member for movement in a plane passing through the magnetic flux field and having a plurality of uniformly spaced teeth to intermittently alter the path of the magnetic field flux;

c. a bore in the axle of the rotating member having an axis substantially aligned opposite the line of rotation of the teeth of said rotor;

d. a bushing in said bore having an inturned flange at one end;

e. said stator including:

i. a permanent magnet core for providing said magnetic flux, said core having one end adjacent said rotor and the other end terminating in a guide member that is operatively confined within said bushing for axial movement in said bore; and

ii. an electric coil on said magnetic core for generating output pulses with successive alterations in said magnetic flux field; and

f. elastic means for yieldably urging the other end of said core into engagement with the inturned flange of said bushing to establish the position of the one end of said core a predetermined distance from the teeth of said rotor during rotation thereof when said rotating member is properly assembled on its axle.

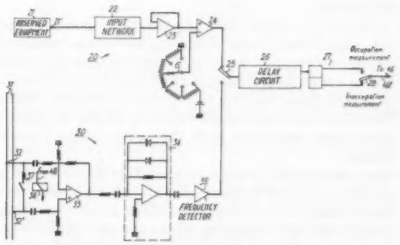
3,928,803
DISTRIBUTION FUNCTION ANALYZER FOR MEASURING TELEPHONE EQUIPMENT HOLDING TIMES

Jean H. Hugon, 63, Avenue du General de Gaulle, 94240 L'Hay-les-Roses; Jean Brosseron, 2, rue des Peupliers, 91630 Marolles-en-Urepoix, and Pierre J. Ligneres, 80 bis, rue des Mures, 92160 Antony, all of France

Filed Nov. 4, 1974, Ser. No. 520,645

Int. Cl.² G04F *8/00*

U.S. Cl. 324—181 **3 Claims**

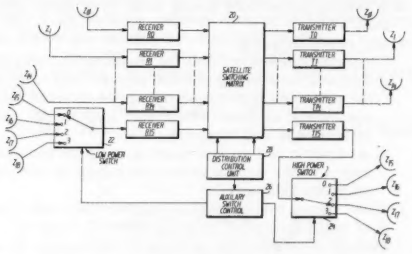


1. An analyzer unit to measure signal duration values and to classify them in function of their deviations in relation to a nominal duration value, said analyzer unit including means for sampling signals all having the same nominal duration value τ with a preset recurrence period, means for measuring and storing the successive duration values of the signals, means for counting the signal duration measurements carried out by said unit up to a predetermined number, means for defining a duration increment $\Delta\tau$, means for adding to and substracting from said nominal duration value said duration increment and the multiples thereof, a plurality of comparators each having a lower and an upper digital limits and defining adjacent time slots, the upper and lower limits of a given time slot being respectively equal to $(\tau - n\Delta\tau)$ and $(\tau - (n-1)\Delta\tau)$ where n is an integer, means for applying the stored duration values to said comparators and a plurality of counters respectively associated with said comparators and receiving therefrom counting pulses when the durations of the applied duration values respectively fall within the time slots of said comparators.

3,928,804
ZONE SHARING TRANSPONDER CONCEPT

William George Schmidt, Rockville, and Richard Sidney Cooperman, Silver Spring, both of Md., assignors to Communications Satellite Corporation (COMSAT), Washington, D.C.

Filed Mar. 30, 1973, Ser. No. 346,388
Int. Cl. H04b *7/20*
U.S. Cl. 325—4 **7 Claims**



7. An improved Space Division Multiple Access Communications satellite system of the type which includes a switching matrix on-board the satellite for selectively interconnecting a plurality of communications receivers each receiving incoming signals from a separate spotbeam antenna in view of its associated discrete geographical zone to a plurality of transmitters each transmitting outgoing signals through a separate spotbeam antenna in view of its associated discrete geographical zone according to a predefined sequence wherein the improvement comprises:

a. a plurality of input switching means on-board the satellite, each of said input switching means alternately connecting an associated group of receive spotbeam antennas to a receiver associated with said input switching means thereby enabling each group of receive spotbeam antennas associated with an input switching means to share the receiver associated with that same input switching means;

b. a plurality of output switching means on-board the satellite, each of said output switching means alternately connecting an associated group of transmit spot-beam antennas to a transmitter associated with said output switching means thereby enabling each group of transmit antennas associated with an output switching means to share the transmitter associated with that same output switching means;

c. local switch control and transmission synchronizing signal means connected to each of said input switching means and to each of said output switching means for synchronizing said input switching means and said output switching means with said switching matrix and further including

counting and logic means for causing terrestrial synchronizing signals to be tranmitted by each of said plurality of transmit spotbeam antennas.

3,928,805
DETECTABILITY OF EMERGENCY BEACON

Donald MacTaggart, Montreal, Canada, assignor to Canadian Marconi Company, Montreal, Canada

Filed Sept. 20, 1973, Ser. No. 399,069
Int. Cl.² H04B *1/10*
U.S. Cl. 325—65 **1 Claim**

1. A method for increasing the range of an emergency locator radio transmitter beacon and for conserving transmitter power of the transmitter;

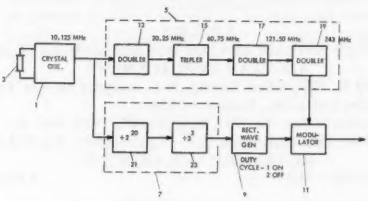
said method comprising;

amplitude modulating a carrier waveform, having a frequency which is accurately controlled by a crystal oscillator, of the transmitter with a modulating rectangular waveform at a modulating frequency which is a precise submultiple of the accurately controlled carrier waveform frequency;

transmitting the modulated waveform by radio waves;

receiving said transmitted signal in a receiver means;

demodulating said received signal;



and cross-correlating said demodulated signal with the output of a reference signal source in said receiver means to thereby determine whether said demodulated signal is identical with said output, of said reference signal source;

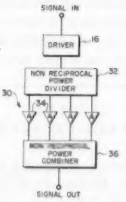
providing an indication signal when said demodulated signal is identical with said output of said reference signal source;

characterized in that the transmitter is cyclically turned on and off to preserve power.

3,928,806
POWER DIVIDING AND COMBINING TECHNIQUES FOR MICROWAVE AMPLIFIERS

John L. Carter, Ocean, and Joseph McGowan, Spring Lake Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,177
Int. Cl.² H04B *1/04*
U.S. Cl. 325—128 **3 Claims**



1. In a microwave transmitter, in combination

an antenna,

a microwave signal power amplifier feeding the antenna and having an overall gain exceeding the capacity of a single solid-state amplifier unit, the power amplifier comprising, an N-port circulator having an input port for the signal power to be amplified,

N-1 solid-state amplifier units,

an isomismatch coupled to each of the other N-1 ports of the circulator for coupling signal power from the circulator to the N-1 solid-state amplifier units, respectively and for isolating the N-1 ports against any return of signal power incident to the isomismatch from the direction opposite from the circulator, the isomismatches having reflect-transmit ratios respectively whereby they transmit predetermined fractions of the signal power incident from the respective circulator port to the respective solid-state power amplifier, the isomismatch coupled to the last of the N-1 ports transmitting all of the power incident from the last port,

a second N-port circulator having one output port for the transmitting amplified power output to the antenna,

N-1 isolator-reflector devices coupling the outputs of the N-1 solid-state amplifier units and the other N-1 ports of the second circulator for transmitting all incident signal power from the respective amplifier units to the N-1 ports of the second circulator and for reflecting back to the second circulator ports any signal power incident to the isoreflectors from the respective second circulator ports.

3,928,807

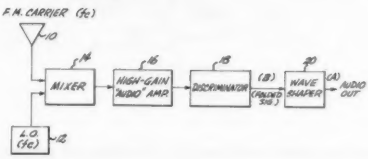
HOMODYNE FM RECEIVER WITH FOLDED SIGNAL AND GATED UNFOLDING SIGNAL DETECTION

Stephen F. Weiss, 2157 N. 64th, Seattle, Wash. 98103

Filed Nov. 17, 1969, Ser. No. 877,271

Int. Cl.² H04B *1/30*

U.S. Cl. 325—344 **3 Claims**



1. An FM receiver comprising means to convert a receiver FM carrier into a folded audio signal wherein alternate half cycles are of reversed polarity, and a wave shaper circuit means operable in response to said folded audio signal to reconstitute said audio signal including first means reversing the polarity of alternate half cycles thereof and including second means mixing the unreversed half cycles with the reversed half cycles of such folded audio signal.

3,928,808

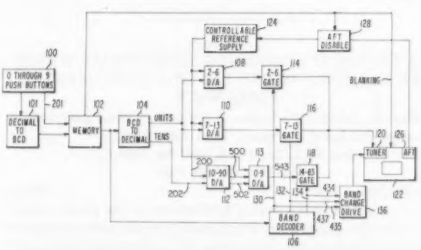
ANALOG VOLTAGE GENERATORS FOR TELEVISION TUNERS

Wayne Wheeler Evans, Carmel, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 18, 1974, Ser. No. 434,402

Int. Cl.² H04N *5/50*

U.S. Cl. 325—464 **18 Claims**



1. In a television receiver having at least one voltage controlled tuner, a channel selection system for tuning said voltage controlled tuner comprising:

a source of reference voltage;

first and second resistor ladder networks having a respective first and second plurality of series coupled resistor elements, a respective first and second plurality of output terminals, ones of said first plurality of output terminals being paired with ones of said second plurality of output terminals such that the voltage difference between terminals of said pairs is substantially equal to the voltage required to tune said voltage controlled tuner over a plurality of channels, said ladder networks further having respective input terminals, said input terminals coupled in parallel to said source of reference voltage

a channel selection means for providing control signals responsive to selection of particular television channels;

first and second gating means receptive to signals from said channel selection means and respectively coupled to said plurality of output terminals of said first and second ladder networks for providing respective first and second output signals responsive to a selected channel

a third resistor ladder network having first and second input terminals respectively coupled to said first and second output terminals of said first and second gating means and a plurality of output terminals; and

coupling means responsive to said control signals for coupling a selected one of said output terminals of said third network to said tuner and providing a tuning voltage thereto.

3,928,809

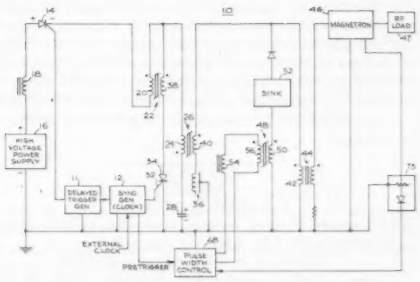
PULSE WIDTH CONTROL SYSTEM

Dennis E. Tschudi, Granada Hills, and Richard H. Geordan, Covina, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed May 6, 1974, Ser. No. 467,199

Int. Cl.² H03K *5/04*

U.S. Cl. 328—58 **22 Claims**



1. A pulse width control system including:

means for generating a pulse of a first width, said generating means having output means adapted for coupling to a load;

means for deriving pulses corresponding to the pulses supplied to said load;

converting means for converting the widths of pulses from said deriving means to voltages representative of such widths;

pulse with reference means; and

automatic means coupled to said output means and responsive to a combination of the voltages from said reference and converting means, respectively, to determine what portion of the width of said pulse of a first width is coupled from said output means to said load.

18. A system for controlling the width of pulses from a pulse generator comprising, in combination:

a pulse generator having the capability of generating pulses of controllable width;

drive means coupled to trigger the pulse generator;

predeterminable pulse width control means coupled to provide a signal to the drive means to control the triggering of the pulse generator; and

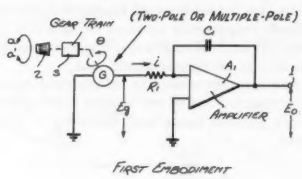
a pulse width detector coupled between an output of the pulse generator and an input of the control means; the control means including

means for comparing the output of the pulse width detector with a predetermined condition of the control means and controlling the signal to the drive means in accordance with the result of said comparison.

3,928,810
ELECTRONIC ANALOG HOLD CIRCUIT

Mikio Narita, Yokohama; Kiyoto Ohashi, Tokyo, and Jun Yamamoto, Yokohama, all of Japan, assignors to Fischer & Porter Co., Warminster, Pa.

Filed Jan. 17, 1974, Ser. No. 434,001
Claims priority, application Japan, Jan. 25, 1973, 48-9941
Int. Cl. G06g 7/18; H03b 3/02; H03k 1/14
U.S. Cl. 328—127 **6 Claims**

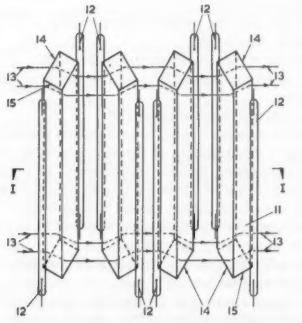


1. An electronic analog hold circuit comprising:
a. an operational amplifier having a hold capacitor connected thereto and
b. a manually operated device to alter the output of the hold circuit, said device including a D-C generator connected between a point of reference potential and an input to said amplifier, said generator being rotated in either direction by means of a manually operated knob or thumb wheel which is mechanically coupled to the generator shaft to cause it to make several turns for each turn of the knob or wheel, whereby the voltage produced by said generator has a polarity that depends on the direction of rotation and gives rise to a current which charges said capacitor to change the output of said analog hold circuit.

3,928,811
LASER AMPLIFIER

John Leonard Hughes, Aranda, Australia, assignor to Quentron Optics Pty Ltd, Adelaide, Australia

Filed Feb. 6, 1974, Ser. No. 439,920
Claims priority, application Australia, Feb. 9, 1973, 2210/73
Int. Cl.² H01S 3/02, 3/05
U.S. Cl. 330—4.3 **8 Claims**

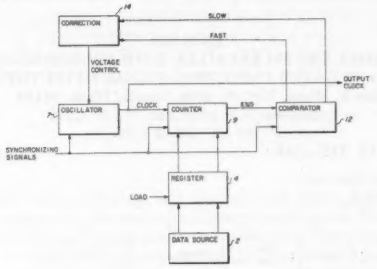


1. An elongated rectangular slab-shaped laser amplifier device having one pair of opposite side surfaces which are optically polished, said optically polished side surfaces being parallel to the longitudinal axis of the slab, with all other surfaces being optically unpolished, and means for introducing excitation radiation through said unpolished side surfaces with said device adapted to eliminate laser radiation and excitation through said unpolished end surfaces.

3,928,812
PROGRAMMABLE BIT CLOCK OSCILLATOR FOR CONTROLLING THE PROCESSING OF BINARY DIGITS

Roger D. Bates, Sunnydale, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 23, 1973, Ser. No. 418,507
Int. Cl. H03b 3/04
U.S. Cl. 331—1 A **8 Claims**



1. A programmable oscillator for controlling the processing of binary digits, comprising:
oscillator means for providing an output clock signal indicative of the operating speed of said oscillator means,
counter means for receiving binary data indicative of the desired operating speed of said oscillator means,
said counter means being responsive both to the output clock signal from said oscillator means and to synchronizing signals which control the countdown of said counter means from the binary data value for providing an output signal,
comparator means for comparing the output of said counter means with synchronizing signals,
correction means responsive to the output of said comparator means for generating incremental correction signals which control the operating speed of said oscillator means, and
timing means responsive to one of said synchronizing signals for generating a disabling signal which further controls said oscillator means such that said oscillator means commences predetermined bit streams with the same phase.

3,928,813
DEVICE FOR SYNTHESIZING FREQUENCIES WHICH ARE RATIONAL MULTIPLES OF A FUNDAMENTAL FREQUENCY

Charles A. Kingsford-Smith, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 26, 1974, Ser. No. 509,577
Int. Cl.² H03B 3/04
U.S. Cl. 331—1 A **4 Claims**

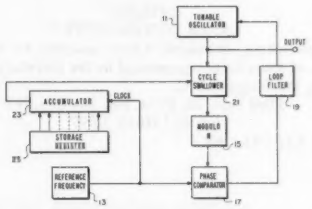
1. An electronic frequency synthesizer of the phase-locked loop type for generating frequencies which are desired rational multiples of the frequency of a reference signal, said synthesizer comprising:
frequency generating means for producing an output signal of a frequency responsive to the level of an input signal; counting means responsive to the output signal of the frequency generating means for producing a wave-train output whose pulse spacing is equal to the total spacing of N pulses of a signal appearing at the input of the counting means, where *N* is a predetermined integer;
phase comparison means for comparing the phases of the wave train output from the counting means and the reference signal and generating an error signal indicative of a phase difference therebetween, said error signal serving as the input signal to the frequency generating means to

thereby vary the frequency of the output signal from the frequency generating means;

digital storage means for storing a representation of a rational fractional interval indicative of the fractional part of said desired rational multiple of said reference frequency;

digital accumulating means for periodically receiving the contents of the digital storage means and accumulating said contents and generating a carryover signal output whenever the accumulated contents exceed the storage capacity of the accumulating means; and

cycle swallowing means interconnected between the frequency generating means and the counter means and being responsive to said carryover signal to alter by one cycle the output of the frequency generating means, for altering the phase of the signal directed to the counting means and phase comparison means by 360°.



3,928,814

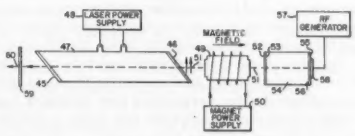
COLLINEAR ACOUSTO-OPTICAL TUNABLE FILTER AND ACOUSTO-OPTICALLY TUNABLE LASER

John D. Feichtner, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1974, Ser. No. 445,526

Int. Cl.² H01S *3/10*

U.S. Cl. 331—94.5 M **6 Claims**



1. An acousto-optically tunable laser comprising:

A. a lasing tube having a broad band radiation output lying on the optical path between a totally reflecting mirror and a partially reflecting mirror;

B. analyzer means which passes only radiation having a predetermined plane of polarization, said analyzer means lying on the optical path between one of said mirrors and said lasing tube;

C. an acousto-optical filter which rotates the plane of polarization of a frequency band of said radiation, said acousto-optical filter lying on the optical path between said analyzer means and said lasing tube; and

D. means for polarizing the radiation of said lasing tube, and said means lying on the optical path between said acousto-optical filter and said lasing tube.

3,928,815

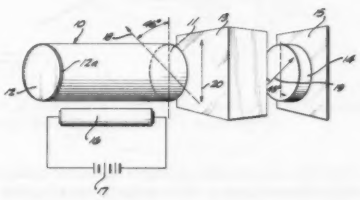
METHOD AND APPARATUS FOR OPERATING LASER

Robert W. Hellwarth, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 128,458, Aug. 1, 1961, abandoned. This application June 3, 1974, Ser. No. 475,714

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 Q **12 Claims**



1. A laser device comprising: a medium capable of being excited to a condition in which population inversion occurs between a pair of energy levels having an energy separation corresponding to a light frequency, means for pumping said medium to said condition of population inversion whereby stimulated emission of light energy at said frequency occurs, means for regeneratively feeding a portion of said light energy back to said medium, and means for varying the regenerative energy fed back to said medium between a first regenerative condition which precludes laser oscillation and a second regenerative condition which permits laser oscillation.

3,928,816

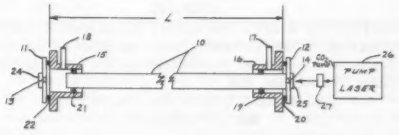
FAR INFRARED WAVEGUIDE LASER

Thomas S. Hartwick, Torrance, and Dean T. Hodges, Jr., Redondo Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 12, 1974, Ser. No. 478,501

Int. Cl.² H01S *3/08*

U.S. Cl. 331—94.5 C **6 Claims**

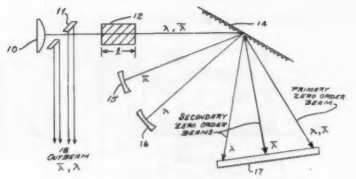


1. A far infrared laser being comprised of a hollow waveguide resonator of preselected length and inner diameter in accordance with the infrared wavelength in the region from 50 μm to ~ 1000 μm and having first and second ends, a first and second mirror for said first and second ends, each of said mirrors having a hole of preselected dimension therein, first and second windows sealing said holes in said first and second mirrors, respectively, said first window and said first mirror, in first combination sealing said first end, said second window and said second mirror, in second combination, sealing said second end, a preselected active laser medium in said hollow waveguide resonator, means to establish a preselected pressure in said hollow waveguide resonator, and laser pump means to optically excite said preselected active laser medium by way of said first combination to provide output radiation by way of said second combination.

3,928,817
MULTIPLE-SELECTED-LINE UNSTABLE RESONATOR

Richard A. Chodzko, Palos VErdes Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1974, Ser. No. 501,728
Int. Cl.² H01S 3/082
U.S. Cl. 331—94.5 C **3 Claims**

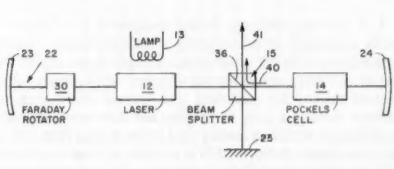


1. A multiple-selected-line unstable resonator comprising a first total reflector having a first predetermined radius, R_1, a blazed diffraction grating displaced from said first total reflector and positioned at an off-Littrow angle therefrom, an active region having a predetermined length and being positioned between said first total reflector and said blazed diffraction grating, a 45° mirror having a hole with a longitudinal axis at a 45° angle with respect to the mirror surface, said 45° mirror disposed between said first total reflector and said active region to provide an output beam, in the recited sequence, said first total reflector, said 45° mirror, said active region, and said blazed diffraction grating being in optical alignment, second and third total reflectors displaced from said blazed diffraction grating at first and second predetermined angles of r_1 and r_1, respectively, said third total reflector being adjacent to said second total reflector, each of said second and third total reflectors having a second predetermined radius of R_2, a cavity with a total length, L, being the sum of the distances between said first total reflector and said blazed diffraction grating and between said blazed diffraction grating and said second and third total reflectors, the radii of curvature of said total reflectors being related to said cavity length, L, by $R_1 + R_2 = 2L$, an absorbing plate displaced from said blazed diffraction grating at a third predetermined angle, r_o, said absorbing plate being adjacent to said third total reflector and operating to absorb secondary zero order beams received from said diffraction grating.

3,928,818
METHOD OF REDUCING LIGHT LEAKAGE IN LASERS

Matthew B. White, Cohasset, Mass., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 17, 1974, Ser. No. 516,241
Int. Cl.² H01S 3/11
U.S. Cl. 331—94.5 T **6 Claims**



1. A system for use in a laser cavity for compensating for the polarization changes in Q switched and cavity dumped lasers caused by anisotropies resulting from optical pumping or other causes comprising:

polarization sensitive means in the laser cavity and reflective means associated with said polarization sensitive means for forming an auxiliary laser cavity;

a laser rod in said auxiliary cavity and means adjacent said rod for optically pumping the laser rod;

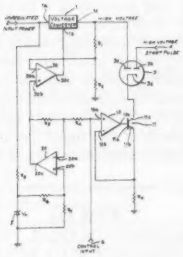
magneto-optical rotation means intermediate said laser rod and the adjacent end of said laser cavity for incrementally rotating the plane of polarization of depolarized radiation until it returns to the original state of polarization; and

means positioned intermediate said polarization sensitive means and the other end of said laser cavity for controllably altering the state of polarization of the intracavity radiation so that the radiation may be deflected out of the laser cavity by said polarization sensitive means.

3,928,819
LASER POWER SUPPLY

Daniel Bernstein, Miraleste, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 20, 1974, Ser. No. 525,592
Int. Cl.² H01S 3/097
U.S. Cl. 331—94.5 PE **2 Claims**



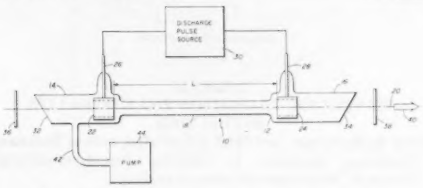
1. A power supply for a gas discharge laser having first and second anodes and a cathode being comprised of a DC high voltage converter to be operated in a pulse width modulated mode and having first and second input terminals and an output terminal, said first input terminal receiving unregulated power and providing in response thereto an output of DC high voltage for application to said first anode of said gas discharge laser, first and second preselected resistors connected in a series arrangement from said output terminal to ground to form a voltage divider network, a first amplifier having an input and output and receiving at said input a control signal, an emitter follower having a base, emitter, and collector, said base being connected to said output of said first amplifier, said collector connected to said cathode of said gas discharge laser, a third preselected resistor connected between said emitter and ground, said first amplifier and emitter follower forcing current through said preselected third resistor so as to be equal to the laser current control voltage divided by the value of said third resistor, a fixed reference voltage source, a second amplifier providing a control voltage equal to the fixed reference voltage applied thereto minus said laser current control voltage, and a third amplifier receiving said control voltage and also a preselected voltage from said voltage divider network, said third amplifier providing an error voltage to said second input of said DC high voltage converter varying the duty cycle of the pulse width modulated voltage converter such that the high voltage is regulated to a value equal to the fixed reference voltage minus the laser current control voltage multiplied by the sum of said preselected first

and second resistors divided by said preselected second resistor.

3,928,820
HIGH GAIN PULSED ION LASER

Romano G. Pappalardo, Sudbury, and Robert Smith, Wilmington, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 25, 1974, Ser. No. 526,646
Int. Cl.² H01S *3/03*
U.S. Cl. 331—94.5 G **11 Claims**



1. A high gain pulsed ion laser comprising

a cylindrical discharge tube having a centrally located axis therethrough and being closed at the ends,

a pair of electrodes within the cylindrical discharge tube, one electrode located effectively near each end of the cylindrical discharge tube, the electrodes being open at least at the axis of the cylindrical discharge tube,

an amount of oxygen within the cylindrical discharge tube sufficient to establish an oxygen pressure in the discharge tube in the range from about 10 to about 100 millitorr,

a pair of reflective elements disposed essentially normal to the axis of the cylindrical discharge tube adjacent to the respective ends thereof, the pair of reflective elements being spaced from each other so as to establish a resonant cavity therebetween at a wavelength at which doubly ionized oxygen can be caused to emit laser radiation, and one of the reflective elements being partially transparent at the laser wavelength, and

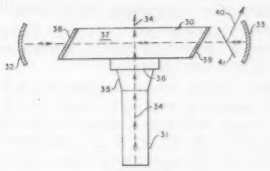
a voltage source connected across the electrodes to produce a discharge pulse having a duration less than about 2.0 microseconds whereby a high gain pulse of light at the doubly ionized oxygen emission wavelength is emitted through the partially transparent reflective element after the end of the discharge pulse.

3,928,821
HIGH ENERGY CHEMICAL LASER SYSTEM

David W. Gregg, Lafayette, and Richard K. Pearson, Pleasanton, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 146,948, May 26, 1971, abandoned.
This application Jan. 23, 1975, Ser. No. 543,611
Int. Cl.² H01S *3/22*
U.S. Cl. 331—94.5 G **6 Claims**

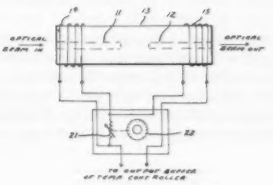
1. A high energy chemical laser system capable of generating a lasing pulse having light frequencies in the 3-micron range comprising: means defining an optical cavity; and explosive gaseous mixture including a reducing agent providing reactive hydrogen isotope species and interhalogen compounds within said cavity, said explosive gaseous mixture consisting essentially of a reducing agent selected from the group consisting of H_2, D_2, CH_4, and B_2H_6, and an interhalogen compound selected from the group consisting of BrF_3, BrF_5, ClF, ClF_3, ClF_5, IF_5, and IF_7, said mixture being in a ratio in the range of about 2–9 parts interhalogen compound to 1 part reducing agent and at a pressure ranging from about 10 to 300 torr; and means for uniformly igniting said gaseous mixture, said igniting means producing a 50 nanosecond pulse of electrons through said gaseous mixture producing an exothermic chemical reaction yielding a lasing reaction species which releases energy for pumping that lasing species at a sufficient rate to generate an extremely large population inversion generating a lasing pulse having light frequencies in the range from about 2.7 to 3.1 microns.



3,928,822
THERMAL DIFFERENTIAL COMPENSATOR

Amos J. Chenoweth, Florissant, Mo., and William E. Heafner, Godfrey, Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed July 9, 1974, Ser. No. 486,803
Int. Cl.² H01S *3/10*
U.S. Cl. 332—7.51 **2 Claims**



1. In a laser modulator having two modulation crystals contained in an oven core having two heater elements, one element substantially controlling the temperature of one crystal element of the modulator and the other heater element substantially controlling the temperature of the other crystal element of the modulator, the improvement for providing a determined thermal differential between the two crystal elements, comprising:

a. controlled source of electrical energy for energizing the said heater elements to provide a determined amount of heat energy to the said oven core; and

b. means cooperating with the said source of electrical energy and the said heater elements for providing a variable controlled thermal difference in temperature between the said two crystal modulating elements.

3,928,823
CODE TRANSLATION ARRANGEMENT

Michael J. Gingell, Sawbridgeworth, England, assignor to International Standard Electric Corporation, New York,, N.Y.

Filed Aug. 22, 1974, Ser. No. 499,742
Claims priority, application United Kingdom, Aug. 23, 1973, 39935/73
Int. Cl.² H03K *13/24*
U.S. Cl. 332—11 R **5 Claims**

1. A pulse density modulation to pulse code modulation translation arrangement comprising:

a source of pulse density modulated signal;

a digital filter coupled to said source; and

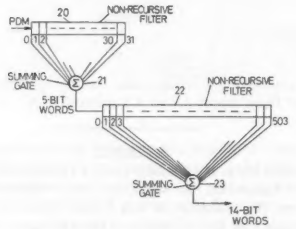
logic circuitry coupled to said digital filter, said logic circuitry selecting every *m*th group of *n* pulses in the output

of said digital filter, where m and n are each integers greater than one;

said digital filter including

a first non-recursive multi-section filter stage having a plurality of unity gain taps, said first filter stage being coupled to said source,

a first summing gate coupled in common to all of said taps of said first filter stage,



a second non-recursive multi-section filter stage having a plurality of unity gain taps, said second filter stage being coupled to the output of said first gate, and

a second summing gate coupled in common to all of said taps of said second filter stage, the output of said second gate being coupled to said logic circuitry.

3,928,824

WAVEGUIDE CIRCULATOR

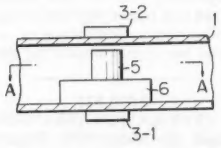
Kazunori Takahashi, and Atsushi Fukasawa, both of Tokyo, Japan, assignors to Oki Electric Industry Company Ltd., Tokyo, Japan

Filed Aug. 14, 1974, Ser. No. 497,263

Claims priority, application Japan, Aug. 30, 1973, 48-96717

Int. Cl.[2] H01P 1/38

U.S. Cl. 333—1.1 **3 Claims**



1. A waveguide circulator including at least three waveguide H plane ports, said ports so arranged that a ferrimagnetic post is provided at their junction, at least one matching conductor which is provided in relation to said ferrimagnetic post, and a magnetic device for statically magnetizing said ferrimagnetic post, characterized in that the cross section of said ferrimagnetic post is circumscribed within a circle having a diameter equal to the value calculated from the equation

$$\frac{2\sqrt{\epsilon\mu_r}}{\lambda_0} \simeq \sqrt{\left(\frac{p}{l}\right)^2 + \left(\frac{2}{\pi}\,\frac{\chi mn}{D}\right)^2}$$

wherein the resonance mode is TM_{mn} ($m \geqq 2$, $n=1$), D is the diameter, l is the length of the resonator, X_{mn} is an eigen value corresponding to mode TM_{mn} ($m \quad 2$, $n=1$), ϵ is the relative dielectric constant of the ferrimagnetic post, μ_r is the relative permeability of the ferrimagnetic post, λ_0 is the wavelength of the center frequency in free space, and p is the number of the standing waves appearing along the ferrimagnetic post in its longitudinal direction.

3,928,825

WAVEGUIDE TRANSITION PIECE WITH LOW REFLECTION

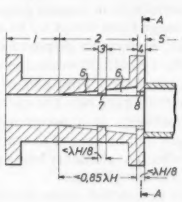
Ernst Kaffenberger, and Erich Schuttloffel, both of Backnang, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed May 3, 1974, Ser. No. 466,861

Claims priority, application Germany, May 4, 1973, 2322429; May 4, 1973, 7316744

Int. Cl.[2] H01P 1/16, 5/08

U.S. Cl. 333—34 **4 Claims**

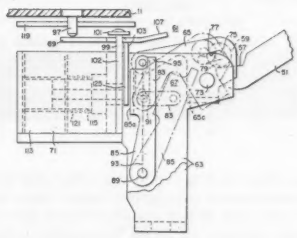


1. In a waveguide transition piece for the broad-banded, low reflection connection of a standard waveguide having a rectangular inner cross section with a smooth or corrugated waveguide having an oval inner cross section, said transition piece being a waveguide with a substantially rectangular inner cross section with the central portion of the longer sides of said inner cross section of a section of said transition piece having a widened portion which extends, in the form of linearly widened conical sections over a length of no more than 0.85 waveguide wavelengths (λ_H), in the direction toward the end of the transition piece to which the oval waveguide is to be connected, said widened portion serving substantially to effect a broadbanded matching of the characteristic impedance of the two waveguides having different inner cross sections which are to be connected by means of concentrated adapter elements which act, at the point where they are disposed, predominantly as parallel capacitances or parallel inductances; the improvement wherein said transition piece includes a further waveguide section disposed between the connecting plane with the oval waveguide and the end of the waveguide section having the conically widened portion, said further waveguide section being no longer than $\lambda_{H/8}$ and having a rectangular inner cross section whose longer sides are uniformly circularly widened in the central portion thereof with the diameter of these widened portions being less than the greatest diameter of said conically widened portion.

3,928,826
CIRCUIT BREAKER WITH IMPROVED TRIPPED LATCH MEANS

Alfred E. Maier, and Robert H. Hill, both of Beaver Falls, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 30, 1974, Ser. No. 474,855
Int. Cl.² H01H 77/00
U.S. Cl. 335—22 **9 Claims**

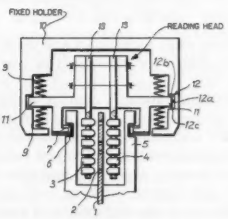


1. A circuit breaker for controlling an electric circuit comprising relatively movable contacts, a releasable arm to effect automatic opening of the contacts, a trip device for latching the releasable arm and comprising a roller, a latch lever, and a linkage mechanism; the roller being mounted on the latch lever for retaining the releasable arm in the latched position, the latch lever being pivotally mounted for movement between latched and unlatched positions, the linkage mechanism comprising an overcenter toggle for holding the latch lever in the latched position, and release means operable to release the overcenter toggle so that the latch lever is movable to the unlatched position.

3,928,827
DEVICE FOR THE PHOTOELECTRIC MARKING AND READING OF TOOLS FOR NC MACHINE TOOLS

Jiri Kepka, Prague; Karel Kovarik, Celakovice; Bohuslav Loun, and Jaromir Zeleny, both of Prague, all of Czechoslovakia, assignors to Vyzkumny ustav obrabecich stroju a obrabeni, Prague, Czechoslovakia

Filed May 22, 1974, Ser. No. 472,286
Claims priority, application Czechoslovakia, May 29, 1973, 3866-73
Int. Cl.² G06K 7/10
U.S. Cl. 235—61.11 E **5 Claims**

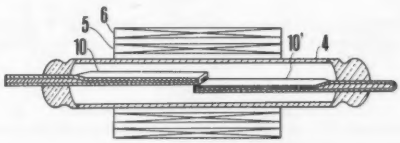


1. In a machine tool equipped with a tool magazine device for an automatic tool exchange, the improvement which comprises a holder for a tool to be exchanged, a coding plate affixed to the tool holder, a clamping holder, and a reading head, means mounting the reading head on the clamping holder, the tool holder and the coding plate mounted thereon being slidably movable past the reading head to permit the reading of the coding plate by the reading head, and at least one guide comprising inter-fitting and relatively slidable parts on the tool holder and the reading head to position such parts relative to each other.

3,928,828
CROSSPOINT ELEMENTS AND ELECTROMAGNETIC COORDINATE SELECTION DEVICES UTILIZING THE SAME

Katsuhiro Kato, Yokohama; Hideo Suzuki, and Norio Yano, both of Tokyo, Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Feb. 12, 1975, Ser. No. 549,193
Claims priority, application Japan, Apr. 30, 1974, 49-48555
Int. Cl.² H01H 67/30
U.S. Cl. 335—112 **9 Claims**

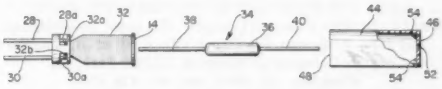


1. In a crosspoint element of the class comprising a glass envelope, a pair of reed pieces sealed in said envelope and having cooperating contacts, and an exciting winding surrounding said envelope for operating said contacts, the improvement wherein each one of said reed pieces comprises a core conductor of a first magnetic metal and a sheath made of a second magnetic metal and coaxially surrounding said core conductor, said first and second magnetic metals having different coercive force.

3,928,829
REED RELAY CONSTRUCTION

Ralph Abrams, Warwick, R.I., assignor to Coto-Coil Co., Inc., Providence, R.I.

Filed Jan. 27, 1975, Ser. No. 544,803
Int. Cl.² H01H 51/28
U.S. Cl. 335—151 **6 Claims**

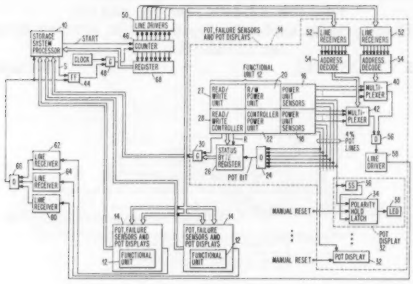


1. A reed relay bobbin constructed of electrically insulating material and comprising a hollow elongate central core, an outwardly extending marginal flange at one end of said core, an enlarged cylindrical body at the other end thereof, a pair of spaced circumferentially extending recesses in said body located intermediate the ends thereof, each of said recesses having a further recessed portion at one end thereof extending through said body and communicating with the exterior of said core, and a pair of spaced leads extending axially from outside said bobbin through said body into said recesses, one lead extending into one of said recesses and the other lead into the other of said recesses, the inner ends of said leads being bent so as to be positioned in said circumferentially extending recesses, one end of said bobbin having an opening of substantially the same size as the interior of said core, and the other end of said bobbin being substantially closed but having an opening therethrough of substantially smaller size than the interior of said core.

3,928,830
DIAGNOSTIC SYSTEM FOR FIELD REPLACEABLE UNITS

Lester Ralph Bellamy, Arvada, and Kenneth LeGrand Hotaling, Boulder, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,650
Int. Cl.² G06F 11/00
U.S. Cl. 235—153 AK 7 Claims



1. Module status reporting apparatus for assisting diagnosis of the operative condition of modules in functional units in a data processing system, said apparatus comprising:

early warning sensing means connected to the modules in the functional units for sensing degradation in the operation of a module;

failure sensing means connected to the modules in the functional units for sensing failure in the operation of a module;

scanning means initiated by the data processing means and connected to said failure sensing means for scanning said failure sensing means;

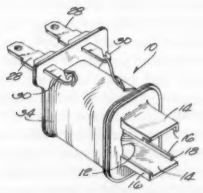
early warning reporting means connected to said early warning sensing means for reporting early warning status of functional unit back to the data processing system;

failure address reporting means connected to said scanning means and said failure sensing means for reporting to the data processing system addresses of failed modules in the functional units.

3,928,831
COIL AND SOLENOID INCORPORATING SAME

Kenji Yatsushiro, Chicago; George F. Kuchuris, Bloomingdale, and John Willigman, Elk Grove Village, all of Ill., assignors to Controls Company of America, Schiller Park, Ill.

Filed Nov. 22, 1974, Ser. No. 526,073
Int. Cl.² H01F 7/08
U.S. Cl. 335—262 6 Claims

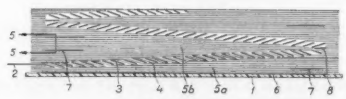


4. A solenoid according to claim 3 in which each guide is channel-like and a bracket fits over each projecting guide to reinforce the guide.

3,928,832
TRANSFORMER WINDING WITH HELICALLY WOUND LAYERS OF A TAPE-LIKE CONDUCTOR

Svante Forsberg; Stig Larbo, and Bjorn Stephensen, all of Ludvika, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Sept. 30, 1974, Ser. No. 511,304
Claims priority, application Sweden, Sept. 28, 1973, 7313223
Int. Cl.² H01F 27/28
U.S. Cl. 336—70 2 Claims

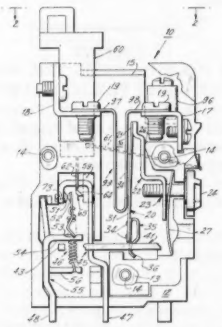


1. A transformer winding comprising a tape-like conductor wound in a succession of over-lapping helical turns forming a plurality of layers with turn insulation between the turns and layer insulation between the layers, the overlap in successive layers increasing outwardly and the axial length of the layers decreases progressively.

3,928,833
OVERLOAD RELAY WITH MEANS TO PREVENT AUTOMATIC RESET

David P. McClellan, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed July 1, 1974, Ser. No. 484,683
Int. Cl.² H01H 71/16
U.S. Cl. 337—56 10 Claims



1. An overload relay including a stationary contact, a movable contact mounted for movement between a first position engaged with said stationary contact and a second position separated from said stationary contact, a repositionable over-center spring means connected to said movable contact to bias the latter to said first position when said movable contact is on one side of a neutral position and to bias said movable contact to said second position when said movable contact is on the other side of said neutral position, over-current responsive means operative upon the occurrence of predetermined overload conditions to automatically operate said movable contact to said second position, a manual operating member operable in a reset stroke to reset said movable contact to said first position, a reclose member, biasing means normally maintaining said reclose member in a rest position on said other side of said neutral position, deflector means operatively positioned to engage said reclose member as said operating member is operated to move in said reset stroke, with engagement of said deflector means and said reclose member moving the latter and thereby loading said biasing means, said deflector

means and said operating means being constructed so that operative engagement thereof is broken abruptly when said operating member reaches a predetermined point in said reset stroke whereby energy stored in said biasing means is released moving said reclose member into engagement with said movable contact to drive the latter to said one side of said neutral position from which point said spring means closes said contacts.

3,928,834

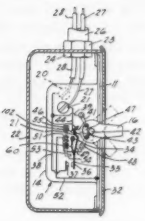
TIME DELAY SWITCH

William E. Soong, 18W282 71st St., Westmont, Ill. 60559

Filed Mar. 4, 1974, Ser. No. 447,877

Int. Cl.² H01H *61/00, 71/16*

U.S. Cl. 337—81 **7 Claims**



1. A three position electrical switch having "on", "off", and "time delay off" positions comprising, a switch housing, a pair of power supply leads, a snap action member with two stable positions mounted in said housing, a first contact carried on said snap action member, a second contact mounted in said housing and engageable with said first contact in one of said stable positions of said snap action member and electrically connected to one of said pair of power leads, a pivotally mounted V-shaped actuating member electrically connected to the other one of said pair of power leads and mechanically coupled to said snap action member and electrically connected to said first contact, a bimetallic member mounted so that in a first position it engages said switch actuator to move it to one of said stable positions to separate said first and second contacts, heating means mounted adjacent said bimetallic member, and a control member engageable with said actuating member to move it and said snap action member, and circuit means connected to said control member for connecting said heating means to said one of said pair of power leads when said control member does not engage said actuating member, said second side of said heating means connected to ground and said control member has a portion engageable with both legs of said V-shaped actuating member to move it either direction.

3,928,835

ELECTRIC SWITCH BOX

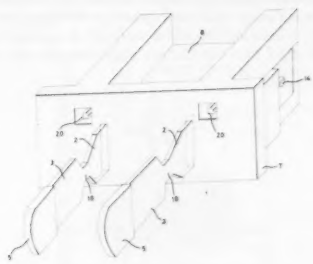
Jorge Castro-Genera, Escobedo Sur 733 Suite 201, Monterrey, Nueva Leon, Mexico

Filed Apr. 26, 1974, Ser. No. 464,517

Int. Cl.² H01H *85/04*

U.S. Cl. 337—295 **3 Claims**

1. For use in an electric switch box defining a continuous electric circuit, a fusible element, comprising in combination, a male member formed of a flat longitudinal insulating member having a frontal wedge, a posterior wedge, a thinner brace section spaced therebetween, an insulating handle about one end constituting one of said wedges, and a thin conducting



layer affixed on at least one side of said insulating member to constitute substantially the same shape as said flat member.

3,928,836

MAGNETORESISTIVE ELEMENT

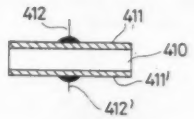
Yoshimi Makino, Fujisawa; Tsutomu Okamoto, Yokohama, and Iwao Kamiya, Chigasaki, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 10, 1974, Ser. No. 487,282

Claims priority, application Japan, July 13, 1973, 48-97655

Int. Cl.² H01C *7/16*

U.S. Cl. 338—32 R **6 Claims**



1. A magnetoresistive element comprising an insulating substrate, a first current conducting ferromagnetic metal film strip on said substrate and having a current carrying ability predominantly in one direction, a second current carrying ferromagnetic metal film strip on said substrate having a current carrying ability predominantly in a direction substantially perpendicular to said one direction, first ends of said strips being connected together, a current input terminal connected to the opposite ends of said strips and an output terminal connected to the junction between the two strips.

3,928,837

CERAMIC OXIDE RESISTOR ELEMENT

Friedrich J. Esper; Karl-Hermann Friese, both of Leonberg, and Rudolf Pollner, Kornwestheim, all of Germany, assignors to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Sept. 6, 1974, Ser. No. 503,846

Claims priority, application Germany, Sept. 27, 1973, 2348589

Int. Cl.² H01C *7/04*

U.S. Cl. 338—22 R **10 Claims**

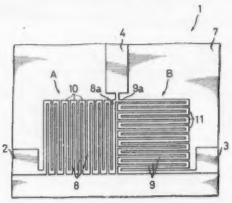
1. A ceramic oxide resistance element having a negative temperature coefficient at temperatures above about 200°C comprising

a shaped body comprising Fe_2O_3 about 50% by weight of Al_2O_3 and MnO in weight percent based on the total Fe_2O_3 and Al_2O_3 within the range of

$$X(C_{Fe_2O_3})\ 1.6$$

wherein X is from 0.3 to 12, and wherein $C_{Fe_2O_3}$ is the concentration of Fe_2O_3 in parts by weight based on the total Fe_2O_3 and Al_2O_3; and

at least two electrical conductors in electrical contact with said shaped body, said two conductors being spaced apart so that when an electrical current is passed serially through said two conductors and through said shaped



body, the resistance of said shaped body may be measured.

3,928,838

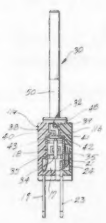
SLIDE POTENTIOMETER

William Wayne Leppek, Milwaukee, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Aug. 23, 1974, Ser. No. 500,012

Int. Cl.² H01C 5/02

U.S. Cl. 338—183 **2 Claims**



1. In a slide potentiometer comprising an electrically non-conductive hollow housing containing a resistive strip and a collector strip and a moveable electrically non-conductive slider having a contact for electrically coupling said collector and said resistor strips, said slider being selectively positionable along a slot formed in said housing through which a portion of said slider extends, and including terminal means coupled to said resistive and collective strips, the improvement comprising:

ridged partition means formed in said housing adjacent to said slot and spaced therefrom for forming a circuitous path from the outside of said housing through said slot to the interior of said housing, said path comprising spaced parallel passageways interconnected by a generally transverse passageway, and

said slider having a portion thereof conforming to said circuitous path for being guided during movement along said slot.

3,928,839

SONAR SYSTEM

Henry L. Warner, and Ted I. Haney, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 5, 1968, Ser. No. 757,628

Int. Cl.² G01S 9/68

U.S. Cl. 340—3 R **4 Claims**

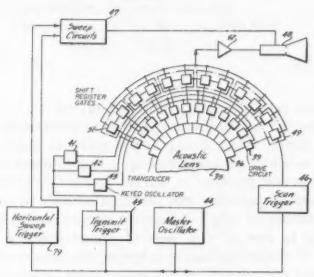
1. An echo-search-ranging system comprising:

a plurality of reversible, piezoelectric transducer elements mounted in a contiguous orientation with respect to one another, each of said transducer elements constructed to radiate and receive compressional wave energy at a one of three predetermined frequencies and different from the frequencies of the transducer elements adjacent thereto;

a refractive fluid filled acoustic lens located in contiguous relationship with said plurality of transducer elements in such a manner as to direct compressional wave energy from and returned reflections to said reversible transducer elements, thereby creating a composite volume of predetermined shape comprised of individual volumes associated with each of said transducer elements;

a plurality of three winding electrical inductors corresponding in number to said plurality of reversible transducing elements and having a first winding of each thereof connected to one of said transducer elements for conducting electrical signals thereto and therefrom;

first electrical oscillator means having a first of said three predetermined frequencies electrically joined to the second windings of the aforesaid three winding electrical inductors connected to transducer elements of said first frequency for timely supplying a burst of electrical energy of said first frequency thereto for transmission thereby to the aforesaid transducer element connected to said first winding thereof;



second electrical oscillator means having a second frequency of said three predetermined frequencies electrically joined to the second windings of the aforesaid three winding electrical inductors connected to transducer elements of said second frequency for timely supplying a burst of electrical energy of said second frequqency thereto for transmission thereby to the aforesaid transducer element connected to said first winding thereof;

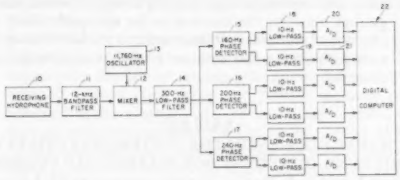
third electrical oscillator means having a third frequency electrically joined to the second winding of the remaining ones of the aforesaid three winding electrical inductors which are connected to transducer elements of said third frequency for timely supplying a burst of electrical energy of said third frequency thereto for transmission thereby to the aforesaid transducer element connected to said first winding thereof;

a display circuit having a plurality of input channels corresponding in number to said three winding inductors and electrically joined to said third windings thereof for displaying echo signals from said transducer elements; and an electrical timing circuit electrically joined to said display circuit and said first, second, and third oscillator means for establishing a time relationship therebetween.

3,928,840
TRACKING SYSTEM FOR UNDERWATER OBJECTS

Robert C. Spindel, North Falmouth, and Robert P. Porter, Falmouth, both of Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 19, 1974, Ser. No. 462,557
Int. Cl.² G01S 5/18
U.S. Cl. 340—6 R **8 Claims**



1. In a system for tracking the movement of an underwater object, the combination of

first, second and third sound sources moored to the bottom of the ocean in a generally triangular pattern,

said first, second and third sound sources continuously radiating acoustic signals of frequencies f_1, f_2 and f_3, respectively,

means for detecting the composite signal arriving at said object;

means for processing said composite signal so as to produce first, second and third pairs of quadraturely phased signals which are proportional to the sine and cosine of the input phase angles of said signals f_1, f_2 and f_3;

means for converting said pairs of signals to digital signals at a pre-selected data rate; and

computer means for processing said digital signals so as to determine the inverse tangent of the input phase angles and therefrom the instantaneous phases of signals f_1, f_2 and f_3 at said object,

said phases corresponding to changes in the slant range from said object to said sound sources as determined by the wavelengths of f_1, f_2 and f_3.

3,928,841
WELL LOGGING SYSTEM USING SINGLE CONDUCTOR CABLE

Charles B. Vogel, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 3, 1974, Ser. No. 511,868
Int. Cl.² G01V 1/40
U.S. Cl. 340—18 NC **4 Claims**

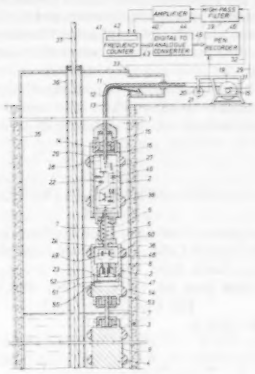
1. An electrical transmission system for a well logging tool comprising:

a well logging tool disposed to be lowered into a well and measure a physical parameter within the well, the value of said measurement being converted to an oscillating voltage whose frequency is related to said measurement; at least one housing, said logging tool being disposed in said housing, said housing in addition having at least a portion of its outer surface formed of a metal;

a cable, said cable being formed of a central metallic stress member and a smooth outer insulating covering, said stress member in addition being coupled to said housing by an insulated coupling member;

two terminal means, one of said terminals being connected to said stress member and the other terminal being connected to the metal portion of said housing, said oscillating voltage being supplied to said two terminals; and

amplifing means disposed at the surface of said well and coupled to the stress member and ground to detect said

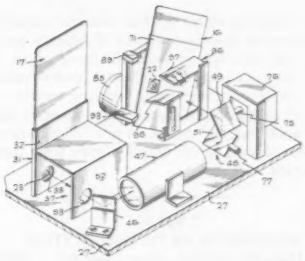


oscillating voltage, resulting from the capacitive coupling between said metal portion of said housing and ground.

3,928,842
FINGERPRINT COMPARATOR

Harold Green, Los Angeles, and Stephen J. Halasz, Claremont, both of Calif., assignors to Veriprint Systems Corporation, Chatsworth, Calif.

Filed May 9, 1974, Ser. No. 468,425
Int. Cl.² G06K 9/08
U.S. Cl. 340—146.3 Q **15 Claims**



1. An apparatus for rapid automatic comparison of two patterns, each located and oriented randomly within a bounded plane area, comprising:

a source of intense incoherent light illuminating a first one of said patterns;

optical projection means interposed between said patterns optically superimposing the image of said first pattern on the second of said patterns, said optical projection means including spaced first and second coaxial lenses so arranged that the periphery of the image of said first pattern projected by said first lens into said second lens is vignetted by said second lens;

scanning means positioned between said optical projection means and said second pattern causing said image to traverse said second pattern in a repeating scan raster;

rotation means effectively rotating said scan raster with respect to said second pattern about an axis passing through said second pattern and normal to the plane thereof;

sensing means responsive to the radiance produced by the interaction of said image with said second pattern posi-

tioned adjacent said second pattern, said sensing means emitting an electrical signal whose amplitude and frequency are representative of said radiance;

electrical signal processing means connected with said sensing means electrically comparing the amplitude of said signal with a preestablished correlation amplitude threshold; and

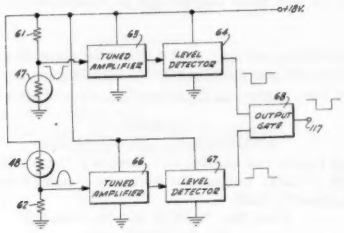
indicator means responsive to said signal processing means and actuated thereby when said signal exceeds said threshold to indicate the matching of said patterns.

3,928,843

DUAL CHANNEL INFRARED INTRUSION ALARM SYSTEM

James Cole Sprout, Los Altos, and Herbert L. Berman, Los Altos Hills, both of Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed June 24, 1974, Ser. No. 482,783
Int. Cl.² G08B *13/18*
U.S. Cl. 340—258 D **18 Claims**



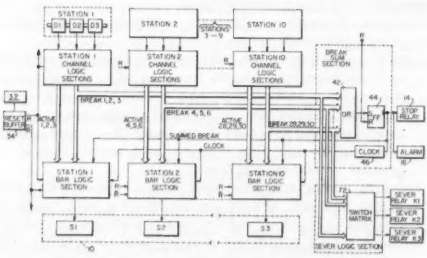
18. In an intrusion alarm system: first and second sensing elements arrangend to provide signals of opposite polarities in response to infrared energy from the body of an intruder, means for directing energy from a field of view simultaneously to both of the sensing elements, first and second amplifier means for providing output signals in response to the signals of opposite polarities, and means for providing an alarm signal upon conjoint receipt of the output signals from both of the amplifier means.

3,928,844

WEB BREAK DETECTOR SYSTEM

Edward F. Meihofer, Norfolk, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Filed June 17, 1974, Ser. No. 479,784
Int. Cl.² G08B *21/00*
U.S. Cl. 340—259 **13 Claims**



1. A web break detector system comprising

A. two or more sensors for sensing web, each said sensor emitting an output signal when it detects the absence of web,

B. means for positioning said sensors along a web path,

C. indicating means corresponding to each sensor for indicating the detection by that sensor of the absence of web, and

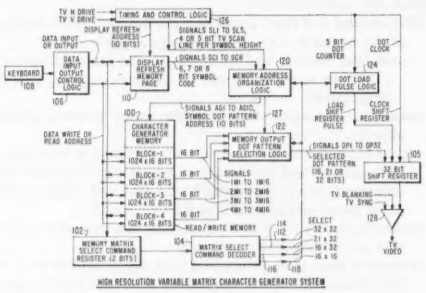
D. means for comparing the times of occurrence of said output signals, said comparing means applying a first signal to the indicating means corresponding to the sensor which first detects the absence of web and simultaneously applying a second signal to the indicating means corresponding to the sensors which subsequently detect the absence of web so that the indicating means automatically and simultaneously provide a display which distinguishes between the location in the web path where the absence of web was first detected and the locations in the web path where the absence of web was subsequently detected.

3,928,845

CHARACTER GENERATOR SYSTEM SELECTIVELY PROVIDING DIFFERENT DOT-MATRIX SIZE SYMBOLS

Robert John Clark, Dorion, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Dec. 11, 1974, Ser. No. 531,613
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 AD **7 Claims**



HIGH RESOLUTION VARIABLE MATRIX CHARACTER GENERATOR SYSTEM

1. In a character generator system for digitally generating symbols for display on a display device exhibiting a television raster scan, said system comprising: a character generator memory having a predetermined fixed overall bit storage capacity for storing each respective one of a plurality of different symbols in two-dimensional dot-matrix form at a separate address location thereof, the dot matrix at all address locations having the same size first-dimension and the same size second-dimension; multibit shift register means having a number of stages at least equal to the size of said first dimension; timing and control logic synchronized with said television raster scan; first means, controlled by said timing and control logic and including a refresh memory page of stored multibit symbol codes defining the message to be displayed, for addressing said character generator memory during any scan line at the beginning of every successive symbol display interval with a multibit symbol dot pattern address word, said symbol dot pattern address word including a symbol code portion defining the character-generatormemory location of the symbol to be displayed in that symbol display interval and a scan-line code portion defining the ordinal position corresponding to the scan line then in progress in the dot matrix second dimension, whereby said character generator memory produces a parallel multibit dot pattern word output at least equal in size to the first dimension size of said dot matrix, at least a portion of said dot pattern word defining the portion of said symbol to be displayed in that symbol display interval which occurs during the scan-line then in progress; and second means controlled by said timing and control logic for loading stages of said shift register means with at least said portion of said parallel multibit dot pattern word output and then shifting

said loaded word output from said shift register means with dot clock pulses during that symbol display interval; the improvement wherein:

a. said character generator memory is a read/write memory which may be programmed to store symbols in any selected single one of a given number of different predetermined dot-matrix sizes, with the number of different symbols and corresponding address locations therefor which can be accommodated being relatively larger for relatively small dot-matrix sizes than for relatively large dot-matrix sizes, and said system includes a dot-matrix register for registering therein the dot-matrix size that has been selected;

b. wherein said first means includes memory address organization logic coupled to said register and responsive to the registration therein for selecting the number of bits of the multibit symbol code from said refresh memory page assigned to the symbol code portion of said symbol dot pattern address word and for selecting the number of bits in said scan-line code portion of said dot pattern address word in accordance with the size of said second dimension of said dot matrix; and

c. said second means includes dot pattern selection, load and clock logic coupled to said display refresh memory page and said register and responsive to the registration therein and the binary value of at least one predetermined bit of said multibit symbol code for selectively loading the stages of said shift register means with said bits of said parallel multibit dot pattern word output and shifting said shift register means to provide a serial sequence of the total number of dots in the first dimension of said selected size of dot matrix during each successive symbol display interval.

3,928,846
OPERATION CONDITION DETECTING AND DISPLAYING DEVICE

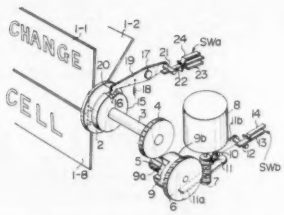
Kiyoyuki Arai, Tokyo, and Tomio Kikuchi, Tokorozawa, both of Japan, assignors to Copal Company Limited, Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 530,990

Claims priority, application Japan, Dec. 14, 1973, 48-141719

Int. Cl.² G08B 5/14

U.S. Cl. 340—325 **1 Claim**



1. In a rotary indication device including a control circuit for energizing drive means adapted to successively switch and display a plurality of indication members in series each time said drive means is fed with a predetermined actuation signal, the improvement which comprises an operation condition detecting and displaying device including at least one abnormal operation condition indication member added to said plurality of indication members in series, a switch cam mounted on the rotary member of said rotary indication device, a first switch provided in said control circuit and interlocked with said switch cam to be actuated thereby so as to energize said drive means to cause the drive means to successively switch and display said indication members in series and abnormal operation condition indication member, an operation condition detection circuit for generating a check signal when said detection circuit detects an abnormal operation condition of said indication device and a second switch provided in said control circuit and interlocked with said cam disc to be a actuated thereby, said second switch being so arranged that when said abnormal operation condition indication member is positioned in the displaying position, the second switch energizes said drive means to cause the drive means to pass the abnormal operation condition indication member over said displaying position and bring the succeeding indication member in series to the displaying position and when the second switch is fed with said check input signal regardless of the operation of said first switch, the second switch energizes said drive means to cause the drive means to successively switch said indication means in series until said abnormal operation condition indication member is brought to the displaying position whereby the abnormal operation condition indication member is displayed.

3,928,847
FAST SCAN ELECTRONIC CIRCUIT WITH CONTACT BOUNCE ELIMINATION FOR AN AUTOMATIC TYPING SYSTEM KEYBOARD

Gary W. Spence, Loretto, Minn., assignor to CPT Corporation, Hopkins, Minn.

Filed Feb. 4, 1974, Ser. No. 439,310

Int. Cl.² G08C 1/00

U.S. Cl. 340—365 E **8 Claims**

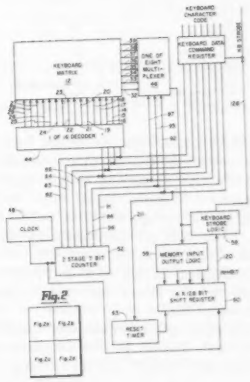


Fig. 2

1. A keyboard circuit comprising:

a plurality of conducting means;

a plurality of continuity switches having contacts for selectively interconnecting two of the conducting means;

counting means for establishing a keyboard code;

sensing means connected to the conducting means and connected to and controlled by the counting means for sequentially interrogating in accordance with the keyboard code the conducting means to determine whether two of the conducting means have been interconnected or disconnected by an operator of the continuity switches and for providing an output signal when two of the conducting means have been interconnected by one of the continuity switches;

means responsive to the output signal for generating a keyboard strobe signal;

storage means operatively connected to the counting means and connected to the sensing means, the storage means comprising at least two memory locations for each keyboard code, for recording the interconnection of two of the conducting means by the selected continuity switch wherein the output signal is electronically recorded in

parallel in each memory location corresponding to the selected continuity switch

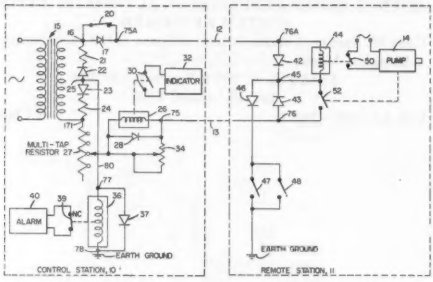
said storage means also being connected to the means for generating a keyboard strobe signal for inhibiting the means for generating a keyboard strobe signal until all memory locations for the selected keyboard code have been cleared; and

time delay means connected to the storage means for sequentially clearing each memory location for the selected keyboard code, each memory location being serially cleared after time intervals determined by the time delay means after the selected continuity switch has been disconnected by the operator of the continuity switches.

3,928,848
SUPERVISORY CONTROL SYSTEM

Jules Eugene Banville, 161 Hope St., Cumberland, R.I. 02908

Filed May 28, 1974, Ser. No. 473,358
Int. Cl.² G08B *23/00*
U.S. Cl. 340—409 **12 Claims**



1. A supervisory control system for use between a control station **10** and a remote station **11** connected by a pair of transmission lines **12, 13** carrying an a.c. signal, comprising:

first rectifying means **42, 43** having an output terminal **45**, said first rectifying means being connected across said transmission lines **12, 13** at said remote station **11** for generating a rectified signal at said output terminal **45**;

an electromechanical device **44** at said remote station connected between one of said transmission lines **12** and said output terminal **45**;

second rectifying means **17** in said one transmission line **12** at said control station **10** for blocking positive-going signals from said remote station coming in on said one line **12**;

means **20** for rendering said second rectifying means unblocking;

condition responsive switch means **47, 48** at said remote station **11** for selectively connecting said output terminal **45** to earth ground; and

means at said control station **10**, including an earth ground connection **78** responsive to the selective connection and disconnection of said output terminal **45** to earth ground at the said remote station **11** for indicating the state of said condition responsive switch means **47, 48.**

3,928,849
INTRUSION DETECTOR SELF-TEST SYSTEM

Frank Schwarz, Stamford, Conn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

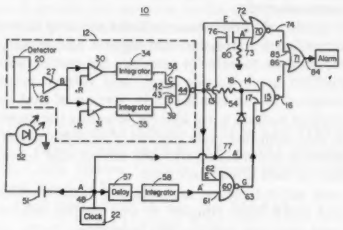
Filed Dec. 17, 1974, Ser. No. 533,741
Int. Cl.² G08B *29/00*
U.S. Cl. 340—410 **10 Claims**

1. In an intrusion alarm system the combination comprising:

A. Detector operated means for providing an output signal of the first of two switching states under normal circuit operation nonintrusion conditions and an output signal of the second of said states in response to activation of the detector,

B. Clock operated means for periodically providing (1) a first signal for simulating an intrusion, (2) a second signal for overriding said signal of said second state from said detector operated means, and (3) a third signal,

C. First gate means operatively connected for receiving the output signal of said detector operated means and said third signal from said clock means for providing an output of a first of two states in response to either a normal



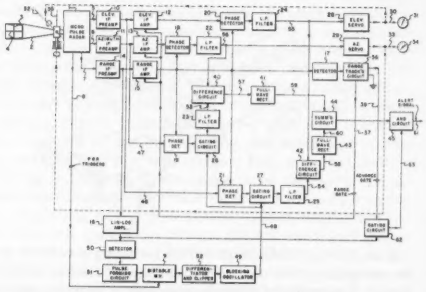
condition, an intrusion, or a simulated intrusion and an output of the second of two states in response to a malfunction, and

D. A second gate means operatively connected for receiving the outputs of said first gate, said detector operated means and said override signal for providing an output of a first of two states in response to either a normal condition or a simulated intrusion condition with normal circuit response thereto and of the second state in response to an actual intrusion or a simulated intrusion coupled with a malfunction.

3,928,850
INTERFERING SIGNAL SENSOR FOR ANGLE TRACKING RADARS

Philip Pollack, Wantagh, and Paul L. Di Matteo, Levittown, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Dec. 29, 1958, Ser. No. 783,603
Int. Cl.² G01S *9/14, 7/36*
U.S. Cl. 343—7.3 **5 Claims**



1. In an angle tracking radar receiver, first means for generating a first signal representing the angular deviation relative to the radar tracking axis of a predetermined target, second means for generating a second signal representing the angular deviation relative to said axis of the target nearest the radar, means for comparing said first and second signals and for generating a first control signal upon the inequality of said first and second signals, means for sensing the closure within a predetermined range interval of said predetermined target and another target situated at lesser range, said means for sensing producing a second control signal upon said range closure,

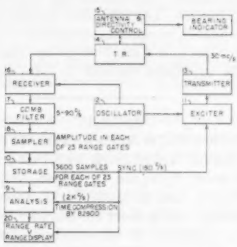
utilization signal generating means, and means for applying said first and second control signals to said last-named means to produce said utilization signal upon the concurrence of said first and second control signals.

3,928,851

OBJECT LOCATOR SYSTEM

Garold K. Jensen, Pinecrest, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 31, 1960, Ser. No. 53,312
Int. Cl.² G01S *9/44*
U.S. Cl. 343—9 **5 Claims**



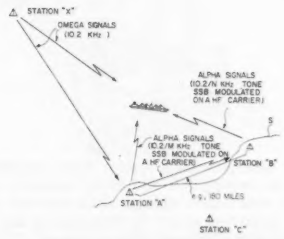
3. An object locator system comprising, means emitting signals, means for receiving signals returned by distant objects, means for storing received signals, a narrow bandwidth analysis channel, means for controlling the playback of stored signals whereby signals stored intermittently for a selected range are played back continuously without substantial intervening time interruptions, and means for varying the frequency of playback signals whereby they are held within the bandwidth of the analysis channel.

3,928,852

RADIO NAVIGATION SYSTEM AND APPARATUS

A. Clifford Barker, Virginia Beach, Va., assignor to Navidyne Corporation, Hampton, Va.

Filed Oct. 25, 1973, Ser. No. 409,363
Int. Cl.² G01S *1/30*
U.S. Cl. 343—105 R **25 Claims**


STATION "X"
OMEGA SIGNALS (10.2 KHz)
ALPHA SIGNALS (10.2/N KHz TONE SSB MODULATED ON A HF CARRIER)
ALPHA SIGNALS (10.2/M KHz TONE SSB MODULATED ON A HF CARRIER)
STATION "B"
STATION "A"
e.g., 150 MILES
STATION "C"

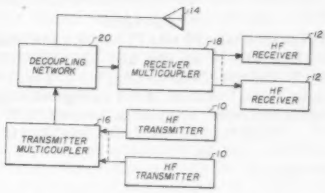
1. A high-resolution local radio navigation system employing a remote VLF transmitting station, said system comprising first and second local stations which are spaced from each other by a distance which is substantially less than the distance between said remote station and either one of said local stations so as to provide a short base line between said local stations and a substantially longer base line between said first local station and said remote station, said first and second local stations including means for transmitting, at higher frequency than VLF frequencies, first and second local signals, respectively, which are each phase-locked to a VLF signal transmitted by said remote station, said first local signal being cooperable with said VLF signal to produce a first family of equi-phase lines corresponding to said first local station and said remote station and further being cooperable with said second local signal to produce a second family of equiphase lines corresponding to said first and second local stations, and a mobile receiver having means for comparing the phase of said first local signal with the phases of said second local signal and said VLF signal to provide an indication of the position of the receiver in relation to said families of equi-phase lines.

3,928,853

DECOUPLING APPARATUS FOR A COMMON-ANTENNA RECEIVE-TRANSMIT SYSTEM

Irving C. Olson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Continuation-in-part of Ser. No. 218,985, Jan. 19, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,110
Int. Cl.² H04L *5/00;* **H04B** *1/44*
U.S. Cl. 343—180 **1 Claim**



1. Communication system apparatus comprising:

reciprocal antenna means;

a first multicoupler means having input means and output means;

a plurality of transmitter means connected to the input means of said first multicoupler means;

a second multicoupler means having input means and output means;

a plurality of receiver means connected to the output means of said second multicoupler means;

non-resonant means having a first port connected to the output means of said first multicoupler, a second port connected to the input means of said second multicoupler, and a third port connected to said antenna means, said non-resonant means comprising capacitive means connected between said second and third ports, first inductive means connected between said first and third ports and a second inductive means connected between said second port and ground and being magnetically coupled to said first inductive means whereby said capacitive means and said second inductive means decouple received energy from said antenna means to said second multicoupler means over a predetermined frequency range substantially independent of the impedance of said first multicoupler means and said first inductive means simultaneously couples energy from said first multicoupler means to said antenna means.

3,928,854

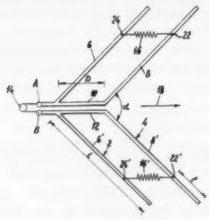
V-TYPE DIRECTIONAL ANTENNA

Maurice Tacussel, 105 bis rue du Point du Jour, 92100 Boulogne Billancourt, France

Filed May 17, 1974, Ser. No. 470,753
Claims priority, application France, May 21, 1973, 73.18305
Int. Cl.² H01Q *9/44, 11/06*
U.S. Cl. 343—735 **14 Claims**

1. A directional antenna comprising at least two longitudinally spaced dipole antennas each formed by a pair of radiators in V formation, the end of each radiator distant from the

open end of the radiator being connected to the corresponding end of the radiator of the adjacent antenna and to one of the outputs of the antenna, wherein at least two adjacent



antennas have a resistive load directly connected between their corresponding radiators in the region spaced from the open ends of the radiators.

3,928,855

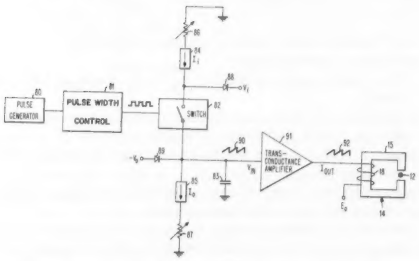
METHOD AND APPARATUS FOR CONTROLLING SATELLITES IN AN INK JET PRINTING SYSTEM

Edward F. Helinski, Johnson City; Ho C. Lee, Endicott, and Jack L. Zable, Vestal, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 18, 1974, Ser. No. 533,913

Int. Cl.² G01D *15/18*

U.S. Cl. 346—1 **20 Claims**



1. In an ink drop forming system of the type having means for supplying ink under pressure to a nozzle or the like to cause a continuous jet stream of ink to flow from said nozzle, and a transducer for causing periodic perturbations in said stream at a predetermined frequency whereby drops are formed in said jet stream, the improvement comprising,

a method of controlling the formation of satellites by energizing said transducer with a signal having an asymmetrical waveform.

3,928,856

SILVER HALIDE PHOTOGRAPHIC EMULSION FOR RECORDING ELECTRON BEAM

Yoshiyuki Nakazawa; Yashuharu Nakamura; Yosuke Nakajima; Junichi Matsuyama, and Akira Sato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

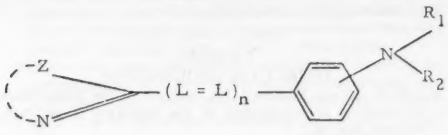
Division of Ser. No. 181,136, Sept. 16, 1971, abandoned. This application Nov. 5, 1973, Ser. No. 413,146

Claims priority, application Japan, Sept. 16, 1970, 45-81112

Int. Cl.² G01D *9/00*

U.S. Cl. 346—1 **6 Claims**

1. An electron beam recording process comprising irradiating, with an electron beam, an electron beam recording material comprising a silver halide emulsion whose silver halide grains have a mean grain size no more than 0.2 micron and have adsorbed thereon at least one aminostyryl base represented by the following formula:



wherein Z is an atomic group required for forming a pyridine, oxazole, benzoxazole, naphthoxazole, benzimidazole, naphthiomidazole, thiazole, benzthiazole, naphthothiazole, selenazole, benzselenazole, or naphthoselenazole ring, R_1 and R_2 are lower alkyl groups, L is a methine group, and n is 1 or 2, and developing the irradiated material to form an image.

3,928,857

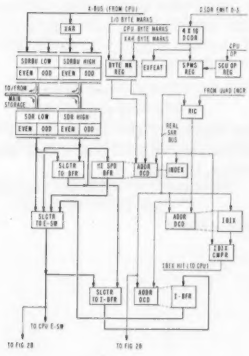
INSTRUCTION FETCH APPARATUS WITH COMBINED LOOK-AHEAD AND LOOK-BEHIND CAPABILITY

Richard S. Carter; Spurgeon G. Hogan, Jr., both of Poughkeepsie; Wan L. Leung, Hyde Park; Bruce L. McGilvray, Pleasant Valley, and Robert H. Werner, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1973, Ser. No. 392,900

Int. Cl.² G06F *9/06*

U.S. Cl. 340—172.5 **4 Claims**



1. In a data processing system which includes a system storage, a processing unit, addressing means for addressing a location in said system storage which contains a desired instruction; improved means for transferring said desired instruction to said processing unit comprising:

instruction buffering means (I-buffer) comprising an auxiliary multi-word memory for storing only a plurality of instructions;

means interconnecting said system storage to said I-buffer for transmission of instructions from said system storage to said I-buffer;

means interconnecting said I-buffer to said processing unit for transmission of instructions from said I-buffer to said processing unit;

means interconnecting said addressing means to said I-buffer for addressing a specific location within said I-buffer that is at least partially defined by an address in said addressing means;

I-buffer indexing means (IBIX) comprising a multi-word memory for storing at least portions of each of a plurality of the system storage addresses of instructions contained in said I-buffer;

means interconnecting said addressing means to said IBIX for addressing a location within said IBIX that corresponds to said specific location within said I-buffer;

comparison means;

means interconnecting said IBIX to an input of said comparison means and means interconnecting said addressing means to another input of said comparison means for comparing address information read from said IBIX to address information contained in said addressing means; said comparison means, upon detection of equality at said two inputs, causing generation of a data available signal which indicates that a desired instruction is contained within said I-buffer;

means within said system responsive to said data available signal to fetch said desired instruction to said processing unit from said I-buffer instead of from said system storage;

means responsive, after a comparison by said comparison means, to the absence of said data available signal to cause said desired instruction to be fetched from said system storage;

means responsive to said absence of said data available signal after said comparison for also causing said desired instruction to be stored into said I-buffer; and

means responsive to said absence of said data available signal after said comparison for causing at least a portion of the system storage address of said desired instruction to be stored into said IBIX.

3,928,858

SYSTEM FOR SETTING PHOTOGRAPHING CONDITIONS

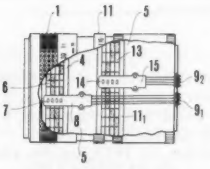
Nobuaki Sakurada, Yokohama; Soichi Nakamoto, Machida; Tadashi Ito, Tokyohama; Fumio Ito, Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 15, 1974, Ser. No. 514,911

Claims priority, application Japan, Oct. 17, 1973, 48-116578

Int. Cl.² G03B 7/00, 7/20

U.S. Cl. 354—23 D **5 Claims**



1. A system for setting photographing informations of a camera comprising:

a camera body having a digital exposure control means;

an interchangeable lens attached to the camera body, having:

an operation means for setting photographing information, and

photographing information setting means having means for coding set values in correspondence to the values set by the operating means; and

a connecting means for connecting the photographing information setting means to the digital exposure control means, and for supplying the digital output of the setting means to the digital exposure control means.

3,928,859

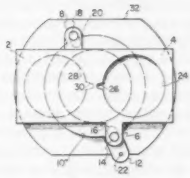
SHUTTER-IRIS FOR AUTOMATIC CAMERA

Dean M. Peterson, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 22, 1974, Ser. No. 453,888

Int. Cl.² G03B 7/14, 9/00

U.S. Cl. 354—27 **18 Claims**



1. In an automatic photographic camera, the combination comprising;

a shutter-iris combination including a first shutter blade and a second shutter blade, each blade having a configured opening,

complementary coupling means coupled to said first and second blades for imparting oppositely directed translational motion to said blades,

first driving means coupled to said coupling means for moving said shutter blades in said oppositely directed translational motion in a shutter-opening direction,

second driving means coupled to said first driving means for returning said first driving means to its original position and thereby to move said shutter blades in said oppositely directed motion in a shutter-closing direction,

programmatic control means for controlling the actuation of said second driving means, said programmatic control means including a light sensing means operative in response to light transmitted through the opening of said shutter to produce a first signal indicative of the exposure of a film in said camera to a predetermined amount of light, exposure control means operative in response to said first signal to produce an exposure control signal, and means operative in response to said exposure control signal to actuate said second driving means.

3,928,860

EXPOSURE CONTROL CIRCUIT FOR PHOTOGRAPHIC CAMERA

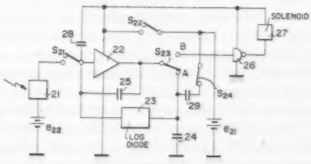
Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Continuation of Ser. No. 398,937, Sept. 20, 1973, abandoned. This application Feb. 21, 1975, Ser. No. 551,904

Claims priority, application Japan, Sept. 26, 1972, 47-96472

Int. Cl.² G03B 7/08

U.S. Cl. 354—51 **10 Claims**



1. An exposure control circuit for a photographic camera including a photo senser, an operational amplifier operatively connected between a power supply and ground and with the photo senser to amplify the input voltage thereof determined

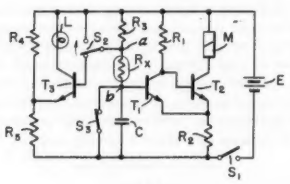
by the resistance of the photo senser which represents the light value from the subject to be photographed, a memorizing capacitor connected with the output of the operational amplifier and switching means for disconnecting the photo senser from the operational amplifier in response to the opening of the shutter of the camera and connecting the memorizing capacitor to a shutter closing means which operates to close the shutter when the input voltage of the switching means reaches a predetermined level whereby the time until the shutter closing means is energized is controlled in accordance with the value of illumination incident upon the photo senser, characterized in that at least one of the input terminal and the output terminal of the operational amplifier has a balancing capacitor having one side connected therewith, the other side of said balancing capacitor being connected to said power supply so as to effect a balance in capacitance between the input from the photo senser to the operational amplifier and the output of the operational amplifier, whereby the input voltage of the operational amplifier is instantly raised up to the operating voltage upon energization of the circuit.

3,928,861

ELECTRONIC CIRCUIT INDICATING LIGHT LEVEL AND CONTROLLING EXPOSURE OF CAMERA

Kiyoshi Kitai, Tokyo, Japan, assignor to Kabushiki Kaisha Hattori Tokeiten, Japan

Filed Dec. 2, 1971, Ser. No. 204,260
Claims priority, application Japan, Dec. 3, 1970, 45-106451
Int. Cl.[2] G03B *7/08, 17/18*
U.S. Cl. 354—60 L **10 Claims**



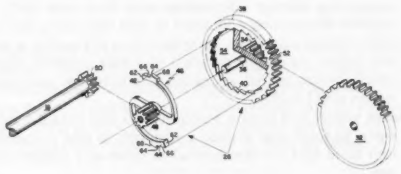
1. In a photographic camera, an indicating and shutter control circuit comprising a power source, three circuit elements namely a single photoelectric element, a comparison resistor and a capacitor connected in series with one another across said power source with first and second connecting points between said circuit elements, said circuit comprising an indicating circuit and a timing circuit, said indicating circuit including solely electrical components comprising said power source, said photoelectric element, said comparison resistor, level indicating means and a first amplifying means for feeding said level indicating means and having a control terminal, said timing circuit including said power source, said single photoelectric element, said capacitor, a timing switch for short circuiting said capacitor, an electromagnet controlling the closing of the shutter and second amplifying means for feeding said electromagnet and having a control terminal connected to said first connecting point, said indicating circuit further comprising a change-over switch means having a first condition in which it connects said second connecting point with said control terminal of said first amplifying means to provide an indication of level of brightness of a subject to be photographed and a second condition in which it short circuits said comparison resistor to provide for control of timing circuit by said single photoelectric element.

3,928,862

PHOTOGRAPHIC FILM ADVANCING AND PROCESSING APPARATUS HAVING A PROTECTIVE DEVICE

Andrew S. Ivester, Charlestown, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1974, Ser. No. 466,399
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—86 **11 Claims**



1. Photographic apparatus for spreading a processing composition across a photosensitive element of an exposed film unit comprising:

a pair of juxtaposed pressure-applying members including at least one roller adapted to be rotated in a predetermined direction for spreading a processing composition across an exposed area of a photosensitive element;

drive means including at least one gear coupled to said one roller;

means for supplying energy for rotary motion of said drive means; and

means for transferring energy including a plurality of gears and ratchet means, said ratchet means including a plurality of rotatable members at least one of which is a gear, said rotatable members including a driving member fixedly secured to a shaft and a driven member including substantially resilient contact means rotatably mounted upon said shaft, said driving member having engagement means included on one side thereof for engaging said substantially resilient contact means of said driven member and cooperating therewith to provide unidirectional rotation of said driven member in transferring energy in a first direction from said means for supplying energy to said drive means and substantially prevents the transfer of energy in a second direction, opposite to said first direction, from said drive means to said means for transferring energy when said roller is manually rotated in said predetermined direction.

3,928,863

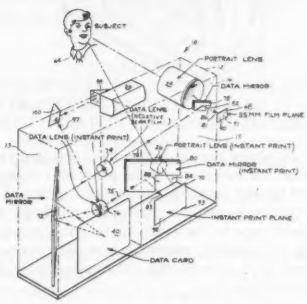
IDENTIFICATION CARD CAMERA

Charles J. Stewart, 1800 Gramercy Ave., Apt. 38, Anaheim, Calif. 92801, and Ernest B. Marjoram, 17874 E. Baintree Ave., Rowland Heights, Calif. 91745

Filed Dec. 17, 1973, Ser. No. 424,942
Int. Cl.[2] G03B *17/24*
U.S. Cl. 354—109 **2 Claims**

1. An identification system camera comprising first and second portrait lens means for simultaneously forming first and second images of a predetermined object in first and second generally coplanar image planes, respectively, a data card and means for removably receiving and holding said data card, first and second data lens means for simultaneously forming first and second images of said data card, first and second image transmitting means for transmitting said first object and said first data card images and said second object and said second data card images onto mutually exclusive and contiguous portions of said first and second image planes, respectively, to thereby form composite images thereof on said first and said second image planes, said portrait lens means each including a shutter mechanism, a photo flash device including means for illuminating said data card, said

shutter mechanisms and said photo flash device being coupled together for synchronous operation, a first film cartridge means for positioning a frame of photographic negative film in said first image plane and second film cartridge means for positioning a frame of direct positive self-processing film in said second image plane, a light-tight enclosure having first and second light-tight compartments enclosing said first and second film frames, said first and second object and said first and second data card images being transmitted into said enclosure through said first and second portrait lens means and said first and second data lens means, respectively, and means for simultaneously exposing said negative film and said positive print film with identical ones of said composite images, said receiving and holding means holding said data card in said



second compartment, said image transmitting means including a first-surface mirror positioned within said second compartment and optically in front of said data card and at an angle of about 45° with respect thereto and a pair of second first-surface mirrors positioned within said first enclosure at an angle of about 45° with respect to said image planes, said first and second data lens means being disposed optically between said first-surface mirror and individual ones of said second first-surface mirrors, respectively, and in a position to intercept the image transmitted through said first and second data lens means by said first-surface mirror, said pair of first-surface mirrors each having a portion thereof removed to define first and second apertures, said first and second images being transmitted through said apertures onto said first and second image planes, respectively.

3,928,864

LINEAR DISPLAY DEVICE

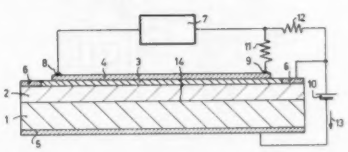
Jacques Fertin, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1973, Ser. No. 425,725

Claims priority, application France, Dec. 19, 1972, 72.45209

Int. Cl. H01l *14/11*

U.S. Cl. 357—17 **13 Claims**



1. A device comprising an electroluminescent diode having an elongated first region of a first conductivity type, an elongated second region of the opposite conductivity type extending on the first region and forming therewith a P-N junction and showing electroluminescent properties when charge carriers are injected into it, electrode connections to the first and second regions, a thin elongated insulated layer extending on the said second region and over and parallel to said P-N junction, an elongated resistance layer extending on the said insulating layer and over said P-N junction, said resistance layer and said insulating layer being transparent to the radiation emitted from said second region, means connected to the first and second region electrode connections to forward bias the junction causing the injection of charge carriers into the second region along its length whereby said carriers recombine in the second region bulk and radiation is emitted, said means being capable of establishing a column of radiation along the length of the device, and means to establish a potential difference between one end of said resistance layer and said second region and to cause a potential gradient along the length of and in the direction of the other end of said resistance layer, said potential difference being such as to drive the injected carriers in accordance with its magnitude toward the surface of the second region where they tend to recombine in a non-radiative manner thereby reducing the radiation thereat, whereby the length of the radiation column is related to the value of the potential difference.

3,928,865

PHOTO-ELECTRICAL TRANSDUCER

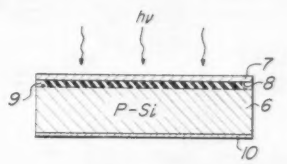
Akio Yamashita, Ikeda, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Apr. 21, 1971, Ser. No. 136,159

Claims priority, application Japan, Apr. 24, 1970, 45-35757

Int. Cl.² H01L *29/48, 29/56, 29/167*

U.S. Cl. 357—30 **1 Claim**



1. A photoelectric transducer comprising a semiconductor wafer, a metal layer on the semiconductor wafer, the semiconductor wafer and the metal layer forming a Schottky barrier therebetween, and a region in the neighborhood of the Schottky barrier heavily doped with a deep-level impurity selected from the group consisting of copper, gold, iron, nickel and manganese.

3,928,866

SEMICONDUCTOR RADIATION DETECTOR AND METHOD OF MANUFACTURING SAME

Jean Louis Digoy, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 9, 1973, Ser. No. 377,797

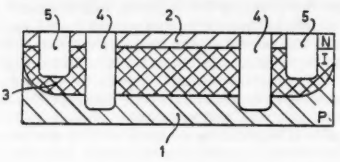
Claims priority, application France, July 10, 1972, 72.24928

Int. Cl. H01l *15/00*

U.S. Cl. 357—30 **8 Claims**

1. A radiation detector comprising a semi-conductor body having two oppositely located major surfaces which are opposed to each other, a surface layer of a first conductivity type adjoining a first of said major surfaces, said surface layer in the semiconductor body adjoining a substantially intrinsic intermediate region which extends through the semiconductor body to substantially the second major surface, an annular surface region of the second conductivity type being present at the second major surface, the first major surface comprising two substantially concentric grooves extending into the semiconductor body from the first major surface to a depth which is larger than the thickness of the surface layer of the first conductivity type, the grooves having unequal depths, a first

one of said grooves terminating in the substantially intrinsic intermediate region, the second one of said grooves being deeper and extending through the substantially intrinsic inter-



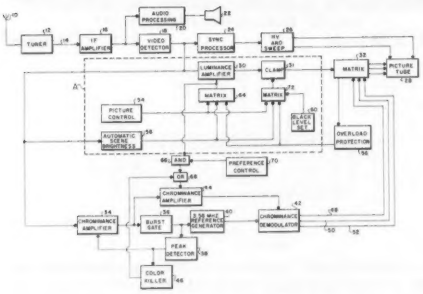
mediate region to the annular surface region of the second conductivity type, said annular region extending between the lower side of the second deeper groove and the second major surface.

3,928,867

TELEVISION RECEIVER WITH PICTURE LEVEL CONTROL

Edward I. Lynch, Portsmouth, Va., assignor to General Electric Company, Portsmouth, Va.

Filed May 10, 1974, Ser. No. 468,953
Int. Cl.[2] H04N *5/14, 5/44*
U.S. Cl. 358—39 **15 Claims**



11. In a television receiver including a picture tube, a source of video signal and coupling means for coupling said video signal to said picture tube, an improved picture control comprising:

level setting means coupled to said coupling means for setting the electrical black level of said video signal to correspond to optical black level;

amplitude control means coupled to said coupling means for controlling the maximum video signal amplitude to be supplied to said picture tube and maintaining said electrical black level in correspondence with said optical black level in response to ambient light change.

3,928,868

TAPE DUPLICATING DEVICE

Robert M. Grindley, Glendale, and Michael J. Strong, Simi, both of Calif., assignors to International Audio-Visual Hong Kong Ltd., Hong Kong

Division of Ser. No. 245,572, April 19, 1972, Pat. No. 3,864,732. This application Aug. 5, 1974, Ser. No. 494,851
Int. Cl.[2] G11B *5/86*
U.S. Cl. 360—15 **3 Claims**

1. A method for transmitting information from a master magnetic tape to a receiving magnetic tape, including the steps of

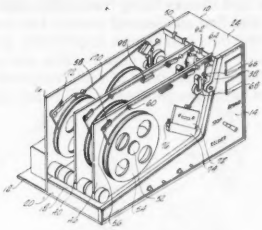
moving such master magnetic tape into operative relationship with a magnetic tape head and a capstan,

mounting a reel of receiving magnetic tape on a panel,

mounting a cassette on said panel,

splicing the receiving magnetic tape to the take-up reel of the cassette,

moving the panel such that the receiving magnetic tape is placed in operative relationship with a recording head and said capstan wherein the receiving magnetic tape



extends across the recording head and is driven by said capstan, the movement of the panel also engaging a drive means for the cartridge take-up reel with said capstan,

electronically transmitting information from the master magnetic tape to the receiving magnetic tape, and

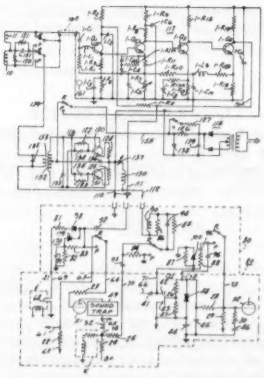
winding the receiving magnetic tape onto the cassett take-up reel as it is receiving information from the master magnetic tape.

3,928,869

VIDEO TRANSDUCING APPARATUS

Marvin Camras, Glencoe, Ill., assignor to IIT Research Institute, Chicago, Ill.

Division of Ser. No. 34,504, May 4, 1970, Pat. No. 3,705,954, which is a division of Ser. No. 649,256, June 27, 1967, Pat. No. 3,596,008, which is a continuation-in-part of Ser. No. 528,934, Feb. 21, 1966, abandoned. This application Sept. 20, 1971, Ser. No. 182,229
Int. Cl. H04n *5/76*
U.S. Cl. 360—55 **1 Claim**



1. In combination with a television display device for display of televison signals, a transducer head for reproducing recorded television signals for displays by means of said television display device, and

a coupling circuit connected with said transducer head and with said television display device for supplying repro-

duced television signals to said television display device for display thereby,

the improvement characterized in that

said coupling circuit comprises a video playback amplifier having an input with a shunt capacitance shunting said input, and an inductor connected in series between said transducer head and said input of said amplifier,

said inductor being disposed closely adjacent to the amplifier input and having a distributed capacitance of a relatively low capacitance value in comparison to said shunt capacitance to prevent pick-up and rectification of radio frequency fields by said video playback amplifier, and

means comprising said inductor for counteracting the effect of hum frequency magnetic fields in the vicinity of said inductor so as to substantially reduce transmission of hum frequency induced voltages from said inductor to said video playback amplifier.

3,928,870

MAGNETO-OPTICAL PROCESSES AND ELEMENTS USING TETRAHEDRALLY COORDINATED DIVALENT COBALT-CONTAINING MAGNETIC MATERIAL

Richard K. Ahrenkiel, and Theodore J. Coburn, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

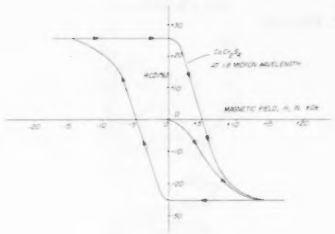
Filed Dec. 14, 1973, Ser. No. 425,045

Int. Cl.² G11B *5/02, 5/32, 5/62;* **H01F** *1/00*

U.S. Cl. 360—59 **24 Claims**

1. A magneto-optical readout process wherein electromagnetic radiation is used to determine the direction of magnetization within discrete areas of a magnetic element, said process comprising:

a. providing a magnetic element having discrete areas which are magnetized, each of said areas comprising an inorganic crystalline material having a magnetically ordered crystal sublattice containing tetrahedrally coordinated divalent cobalt in an amount sufficient to provide a Kerr ellipticity greater than 0.25°,



b. exposing at least one of said discrete areas to radiation having a wavelength corresponding to a crystal field transition of said cobalt, and

c. detecting the change in polarization of said radiation caused by said cobalt to determine the direction of magnetization within said discrete area which has been exposed.

DESIGNS

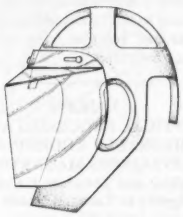
DECEMBER 23, 1975

238,116
TWO PIECE BATHING SUIT
Barbara L. Firkser, 1066 McLean Ave., Wantaugh, N.Y. 11793
Filed May 3, 1974, Ser. No. 466,799
Term of patent 3½ years
Int. Cl. D2—*02*
U.S. Cl. D2—41

238,117
BIB WITH CATCH-POCKET
Karl Gösta Berill Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden
Filed Apr. 16, 1973, Ser. No. 351,189
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—229

238,118
PROTECTIVE HELMET OR THE LIKE
Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207
Filed Nov. 27, 1974, Ser. No. 527,900
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

238,119
PROTECTIVE HELMET OR THE LIKE
Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207
Filed Nov. 27, 1974, Ser. No. 527,901
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

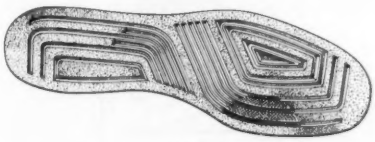


238,120
PROTECTIVE HELMET OR THE LIKE
Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207
Filed Nov. 27, 1974, Ser. No. 527,902
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

238,121
PROTECTIVE HELMET OR THE LIKE
Jhoon Goo Rhee, 2525 N. Ridgeview Road, Arlington, Va. 22207
Filed Nov. 27, 1974, Ser. No. 527,904
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—232

238,122
SPORT SHOE
William J. Cohen, Boston, Mass., assignor to CITC Industries, New York, N.Y.
Filed Aug. 21, 1972, Ser. No. 282,050
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310

238,123
SHOE SOLE
Sumner F. Davis, Salem, N.H., assignor to Converse Rubber Company, a division of Eltra Corporation, Wilmington, Mass.
Filed May 28, 1974, Ser. No. 473,780
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

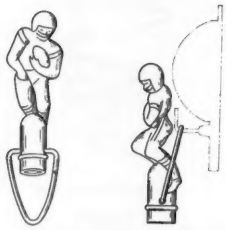


238,124
FOXING TAPE
William J. Cohen, Randolph, Mass., assignor to CITC Industries, New York, N.Y.
Filed June 19, 1974, Ser. No. 480,881
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—328

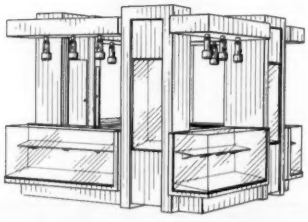
238,125
NECKTIE FOR AN OPEN-COLLAR SHIRT
H. Heath Webb, 216 Applewood Lane, Virginia Beach, Va. 23452
Filed Nov. 6, 1973, Ser. No. 413,240
Term of patent 14 years
Inc. Cl. D2–*05*
U.S. Cl. D2—351

238,126
BRUSH
Robert A. O'Neil, Wheaton, Ill., assignor to Kellogg Brush Manufacturing Co., Easthampton, Mass.
Filed Mar. 1, 1974, Ser. No. 447,078
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—1

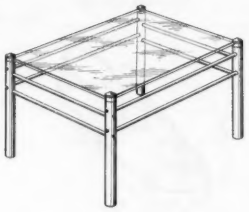
238,127
HANDLE CAP FOR BRUSHES AND THE LIKE
Jeffrey Snyder, 5225 Collins Ave., Miami Beach, Fla. 33140
Original design application July 3, 1973, Ser. No. 376,150. Divided and this application Sept. 9, 1974, Ser. No. 504,046
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—4



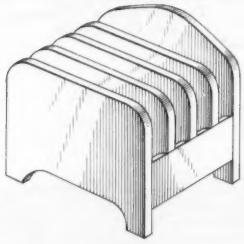
238,128
KIOSK
Richard D. Marquette, Prairie Village, Kans., assignor to Trio, Incorporated, Overland Park, Kans.
Filed Oct. 12, 1973, Ser. No. 406,086
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—169



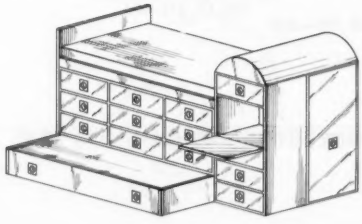
238,129
TABLE OR OTHER SIMILAR ARTICLE
Walter M. Jay, 16 Tweed Road, Fox Lake, Ill. 69920
Filed Jan. 18, 1974, Ser. No. 434,636
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—175



238,130
TENNIS RACKET SUPPORT OR SIMILAR ARTICLE
Daniel Liner, 319 Beverly, Wilmette, Ill. 60091
Filed Sept. 27, 1973, Ser. No. 401,355
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185

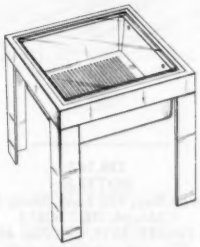


238,131
COMBINED BED AND STORAGE UNIT
Michael A. Mendlin, Springfield, N.J., assignor to Bunk Trunk Distributors, Paramus, N.J.
Original design application July 6, 1971, Ser. No. 160,237, now Patent No. 227,724. Divided and this application Apr. 16, 1973, Ser. No. 351,633
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—80

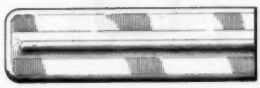


238,132
HANGING SUPPORT FOR PLANTS
Lee H. Stevens, P.O. Box 710, Escondido, Calif. 92025
Filed Aug. 12, 1974, Ser. No. 496,632
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D6—113

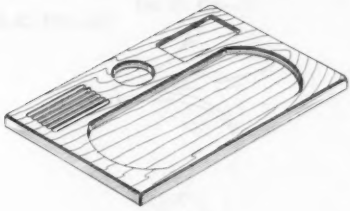
238,133
DISPLAY TABLE
Robert L. Uebele, West Bend, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Sept. 20, 1974, Ser. No. 508,023
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



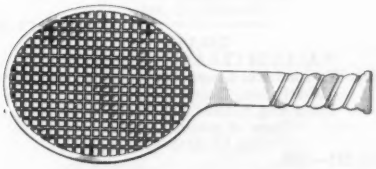
238,134
ARM REST
Merton J. Alexander, 610 Court St., Monrovia, Calif. 91016
Filed Jun. 17, 1974, Ser. No. 479,635
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194



238,135
ROLLING TRAY
Joseph J. Longobardi, Jr., 4905 Sunderland Drive, Boise, Idaho 83704
Filed Dec. 3, 1973, Ser. No. 420,835
Term of patent 14 years
Int. Cl. D7—*04;* D7—*99*
U.S. Cl. D7—43

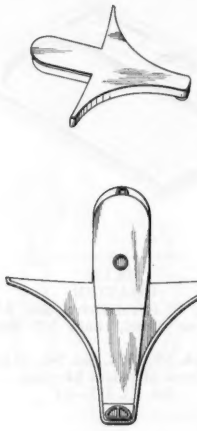


238,136
COASTER
Jerome Goldstein, 17 Rural Drive, and Abraham Goldstein, 205 Secor Road, both of Scarsdale, N.Y. 10583
Filed Feb. 15, 1974, Ser. No. 442,988
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—45

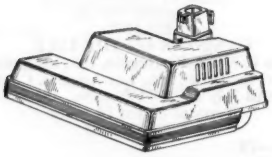


238,137
CANISTER OR THE LIKE
James B. Swett, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed July 25, 1974, Ser. No. 491,887
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—79

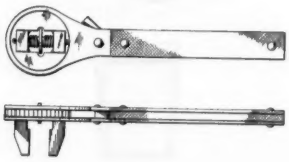
238,138
SPOUT FOR A WATER RESERVOIR TYPE COFFEEMAKER OR SIMILAR ARTICLE
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company
Filed Feb. 27, 1974, Ser. No. 446,519
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—129



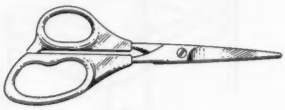
238,139
VACUUM CLEANER HOUSING
Gordon W. Goodrich, Grand Rapids, Mich., assignor to Bissell, Inc., Grand Rapids, Mich.
Filed Aug. 5, 1974, Ser. No. 494,766
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—165



238,140
RATCHET WRENCH
Henry L. Guimarin, Colleyville, Tex. (Rte. 3, Box 337, Grapevine, Tex. 76051)
Filed Sept. 25, 1974, Ser. No. 509,252
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—25



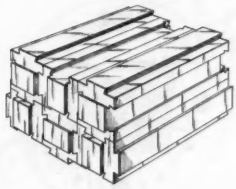
238,141
HAIR CUTTING SCISSORS
Evan R. Kahn, 808 NE. 160th Terrace, North Miami Beach, Fla. 33162
Filed June 28, 1974, Ser. No. 484,458
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



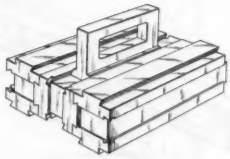
238,142
CLIP FOR PICTURE FRAMES
Samuel Wiener, Jr., Westport, Conn. (451 W. Broadway, New York, N.Y. 10012)
Filed Feb. 8, 1974, Ser. No. 440,668
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—257

238,143
BOTTLE
J. Myron Bay, 990 Lake Shore Drive, Chicago, Ill. 60611
Filed Oct. 15, 1973, Ser. No. 406,604
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48

238,144
BUILDING BLOCK UNIT
Henry King Ketcham, Geneva, Switzerland, assignor to Rolande Ketcham, Geneva, Switzerland
Filed Apr. 26, 1973, Ser. No. 354,668
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—171

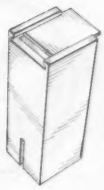


238,145
COMBINED BUILDING BLOCK UNIT AND CARRYING HANDLE OR SIMILAR ARTICLE
Henry King Ketcham, Geneva, Switzerland, assignor to Rolande Ketcham, Geneva, Switzerland
Filed Apr. 26, 1973, Ser. No. 354,472
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—171

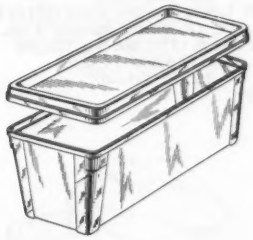


238,146
BOTTLE CARRIER
Rodney K. Calvert, Dunwoody, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed May 28, 1974, Ser. No. 474,086
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—178

238,147
CONTAINER FOR GLASSES AND BOTTLES OR THE LIKE
Markku Vartiainen, Helsinki, Robert Paulig, Ostersundom, and Matti Lahtinen, Helsinki, Finland, assignors to MRM-trading Ltd., Helsinki, Finland
Filed Nov. 7, 1973, Ser. No. 413,515
Claims priority, application Finland May 8, 1973
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—223

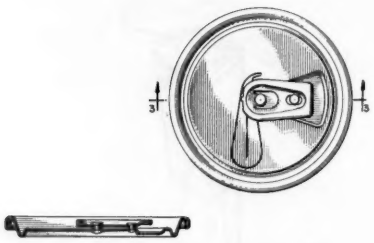


238,148
COMBINED CONTAINER AND COVER FOR FOODSTUFFS OR THE LIKE
Rolf Magnus Dilot, 106 Larkvagen, 22248 Uppakra, Sweden
Filed Dec. 4, 1972, Ser. No. 312,057
Claims priority, application Sweden June 2, 1972
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—219

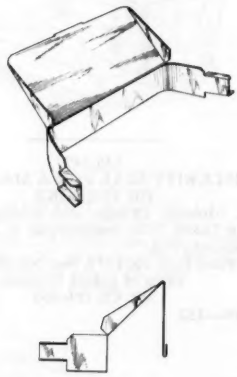


238,149
SECURITY SEAL FOR A MAILBAG OR THE LIKE
Sigurd M. Moberg, Orange, and George A. Lundberg, Pompton Lakes, N.J., assignors to E. J. Brooks Company, Newark, N.J.
Filed June 26, 1974, Ser. No. 483,125
Term of patent 14 years
Int. Cl. D9—*06*
U.S. Cl. D9—252

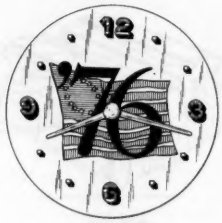
238,150
NON-DETACHABLE EASY-OPEN END CLOSURE
Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed May 17, 1973, Ser. No. 361,168
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—255



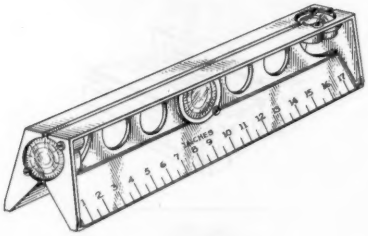
238,151
ACCESSORY TRAY FOR A PAINT CAN OR THE LIKE
Philip E. Shaffer, Grand Junction, Colo. (51413 Highway 6 and 24, No. 19, Glenwood Springs, Colo. 81601)
Filed July 5, 1973, Ser. No. 376,306
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—289



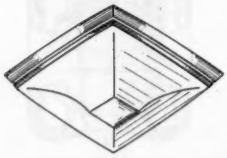
238,152
COMBINED WATCH DIAL AND HANDS THEREFOR
Lester E. Rubenstein, 100 E. Hartsdale Ave., Hartsdale, N.Y. 10530
Filed Aug. 8, 1974, Ser. No. 495,806
Term of patent 3½ years
Int. Cl. D10—*02*
U.S. Cl. D10—33



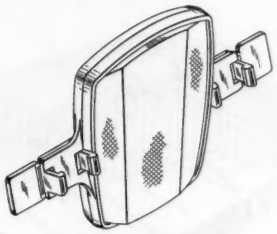
238,153
LEVEL TOOL
Vern H. Johnson and Robert G. Harms, Cheyenne, Wyo., assignors to Loyd Walters, Pine Bluffs, and Donald Kunau, Cheyenne, Wyo., fractional part interest to each
Filed Aug. 29, 1974, Ser. No. 501,700
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—69



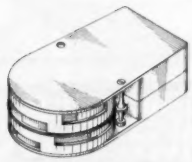
238,154
SMOKE DETECTOR
William C. Tipton, Newark, N.J., and Paul Olney Rawson, Easton, Conn., assignors to General Signal Corporation
Filed May 3, 1974, Ser. No. 466,646
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



238,155
BICYCLE REFLECTOR
Nicholas A. Amoroso, Hillsdale, N.J., assignor to Bright Star Industries, Clifton, N.J.
Original design application Mar. 27, 1974, Ser. No. 455,133. Divided and this application Feb. 5, 1975, Ser. No. 547,364
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

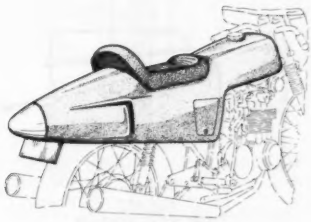


238,156
SONIC SIGNAL GENERATOR WITH SOUND LIMITER
David L. Livermore, Seattle, Wash., assignor to Proctor & Associates Company, Redmond, Wash.
Filed Dec. 12, 1973, Ser. No. 424,164
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116

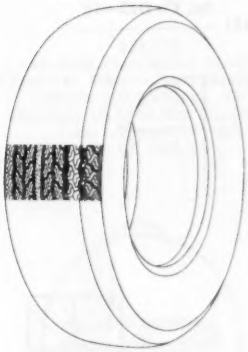


238,157
COMBINED DIAL AND HANDS FOR A WATCH
Lester E. Rubenstein, 100 E. Hartsdale Ave., Hartsdale, N.Y. 10530
Filed Feb. 13, 1974, Ser. No. 434,828
Term of patent 3½ years
Int. Cl. D10—*07*
U.S. Cl. D10—126

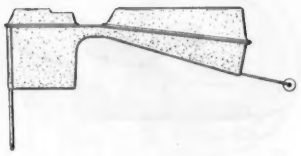
238,158
CYCLE FAIRING
William L. Mitchell, 760 Kennebec Court, Bloomfield Hills, Mich. 48013, and David R. North, 26240 Warner Ave., Warren, Mich. 48091
Filed Sept. 10, 1974, Ser. No. 504,837
Term of patent 7 years
Int. Cl. D12—*11*
U.S. Cl. D12—110

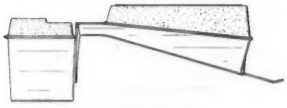


238,159
TIRE
John F. Duderstadt, Cuyahoga Falls, and James W. Stiffler, Tallmadge, Ohio, and Harold D. Fetty, Birmingham, Mich., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Mar. 7, 1974, Ser. No. 448,849
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147

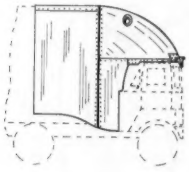


238,160
AUTOMOBILE CONSOLE
David E. Rogers, 147 Highland Ave., Hamden, Conn. 06247
Continuation-in-part of abandoned design application Ser. No. 315,512, Dec. 15, 1972. This application June 10, 1974, Ser. No. 477,853
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

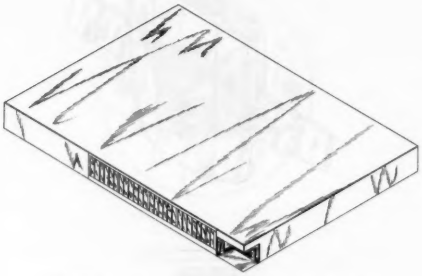




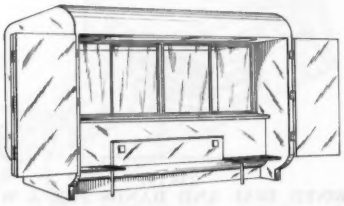
238,161
WINDBREAKER FOR VEHICLES
Marshall S. De Vaughn, P.O. Box 184, Spruce Pine, Ala. 35585
Filed July 6, 1973, Ser. No. 377,074
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



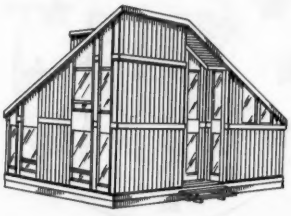
238,162
STORE
Joseph Binder, Oceanside, Michael J. Viesti, Bronx, and Carl Palestini, Lido Beach, N.Y., assignors to The Bohack Corporation, Brooklyn, N.Y.
Filed Aug. 16, 1972, Ser. No. 281,142
(Filed under Rule 47(a) and 35 U.S.C. 116)
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 R



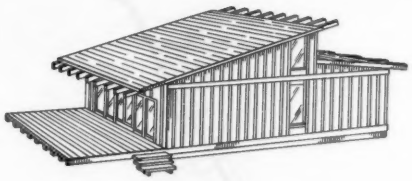
238,163
KIOSK
Wayne W. Enderling, 1301 Trelane Ave., St. Louis, Mo. 63126
Filed Mar. 7, 1974, Ser. No. 448,946
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D13—1 D



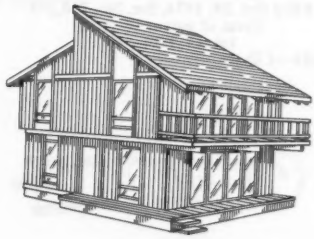
238,164
LEISURE HOUSE
Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504
Filed June 20, 1974, Ser. No. 481,057
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A



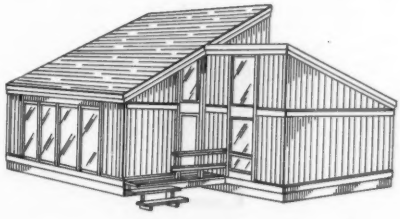
238,165
DWELLING HOUSE
Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504
Filed June 20, 1974, Ser. No. 481,058
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A



238,166
HOUSE
Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504
Filed June 20, 1974, Ser. No. 481,059
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

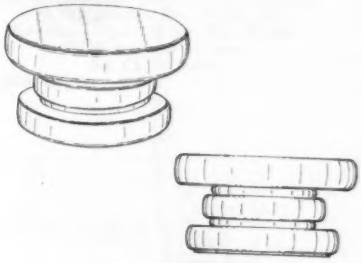


238,167
VACATION HOUSE
Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504
Filed June 20, 1974, Ser. No. 481,060
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A

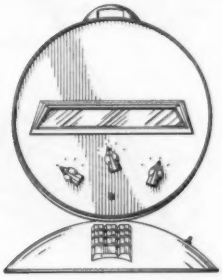


238,168
BUILDING BLOCK OR SIMILAR ARTICLE
Henry King Ketcham, Geneva, Switzerland, assignor to Rolande Ketcham, Geneva, Switzerland
Filed Apr. 26, 1973, Ser. No. 354,669
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R

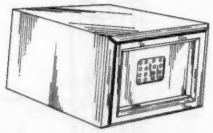
238,169
PAPER WEIGHT
Cecelia A. Bieringer, 100 Wilshire Drive, Minnetonka, Minn. 55343
Filed Mar. 18, 1974, Ser. No. 451,842
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—96



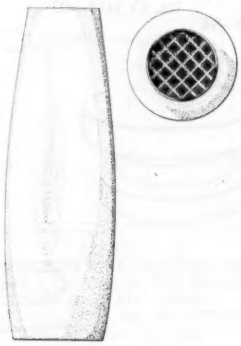
238,170
CASE FOR TEACHING MACHINE
Charles H. Schmidt, 7100 Ottawa NE., Albuquerque, N. Mex. 87110
Filed July 18, 1974, Ser. No. 489,712
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—60



238,171
ULTRASONIC RODENT ELIMINATOR
John T. Banich, Sedalia, Mo., assignor to Design Devices, Inc.
Filed Apr. 22, 1974, Ser. No. 463,052
Term of patent 7 years
Int. Cl. D22—*06*
U.S. Cl. D22—18



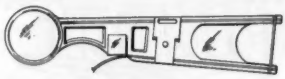
238,172
WATER PURIFYING AND FILTERING UNIT
George H. Blackstone, 2284 Albion St., Toledo, Ohio 43606
Filed Feb. 22, 1974, Ser. No. 444,728
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—3



238,173
DENTAL TOOL
Roger B. Felt, Layton, Utah, assignor to Perma-Technological Industries, Inc., Ogden, Utah
Filed Nov. 19, 1973, Ser. No. 417,440
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

238,174
DENTAL TOOL
Roger B. Felt, Layton, Utah, assignor to Perma-Technological Industries, Inc., Ogden, Utah
Filed Nov. 19, 1973, Ser. No. 417,451
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—1 D

238,175
DENTAL FLOSS APPLICATOR
Franklin Eugene Wharton, 1308 Sartori Ave., Torrance, Calif. 90501
Filed Oct. 29, 1974, Ser. No. 518,375
Term of patent 14 years
Int. Cl. D24—*99*
U.S. Cl. D24—1 D



238,176
ELECTRICAL CONNECTOR
Melvin Korman, North Attleboro, Mass., and Luther M. Sheldon, Cranston, R.I., assignors to General Electric Co., New York, N.Y.
Filed Apr. 18, 1974, Ser. No. 462,067
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 B

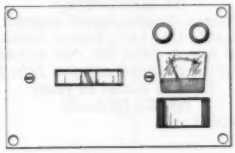
238,177
COMBINED ELECTRIC MOTOR AND FRAME
Yasuhiro Ohishi, 26–34, 5-chome, Nakano, Nakano-ku, Tokyo, Japan
Filed July 17, 1972, Ser. No. 272,621
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D26—5 A

238,178
CABLE CONDUIT WITH ARCHED DETACHABLE CLOSURE PLATE
Frank R. Kinnan, Camas Valley, Oreg., assignor to Midland-Ross Corporation
Filed Jan. 17, 1973, Ser. No. 324,498
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 B

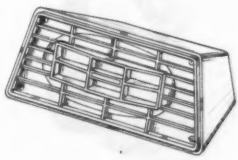
238,179
CABLE CONDUIT WITH DETACHABLE CLOSURE PLATE
Frank R. Kinnan, Camas Valley, Oreg., asssignor to Midland-Ross Corporation
Filed Jan. 17, 1973, Ser. No. 324,499
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5 B

238,180
ELECTRIC BULB
Bertil Valentin Ricksater, Farsta, Sweden, assignor to Bengt Erling Beckman, Bromma, Sweden
Filed Nov. 28, 1972, Ser. No. 296,223
Claims priority, application Sweden Apr. 7, 1972
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D26—8

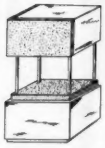
238,181
PANEL MOUNTED MONITORING SWITCH
William G. Roller, Purdy, Mo., assignor to G & R Industries, Inc., Purdy, Mo.
Filed June 17, 1974, Ser. No. 479,863
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13 C



238,182
SPEAKER ENCLOSURE OR THE LIKE
Hisashi Kizawa, Fudomae Mansion, Suite 306, 8–11–5 chome, Nishigotanda, Shinagawa-ku, Tokyo, Japan
Filed Dec. 4, 1972, Ser. No. 311,756
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G



238,183
SPEAKER ENCLOSURE
Nils Lou, 1400 Englewood, St. Paul, Minn. 55104
Filed Mar. 22, 1974, Ser. No. 453,571
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

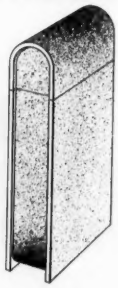


238,184
HEAD PHONE
Kazuhito Ohtomo, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan
Filed Apr. 9, 1974, Ser. No. 459,445
Claims priority, application Japan Feb. 26, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 H

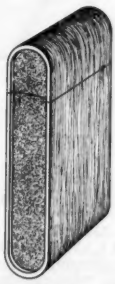
238,185
CEILING SPEAKER
Ronald C. Wellward, 53 S. Clinton Ave., Bayshore, N.Y. 11706, and Sherry Neuman, 72 Yale St., Roslyn Heights, N.Y. 11577
Filed Jan. 10, 1974, Ser. No. 432,228
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 G

238,186
AUXILIARY PUSH BUTTON UNIT FOR TELEPHONE SETS OR SIMILAR ARTICLE
Herbert Kramer, Furstenfeldbruck, and Tonis Kao, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Oct. 25, 1973, Ser. No. 409,612
Claims priority, application Germany Apr. 25, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 A

238,187
CIGARETTE LIGHTER
Alain Carré, Paris, France, assignor to Waterman S.A., Paris, France
Filed July 17, 1974, Ser. No. 489,268
Claims priority, application France Apr. 10, 1974
Term of patent 14 years
Int. Cl. D9—*03*; D27—*05*
U.S. Cl. D27—36

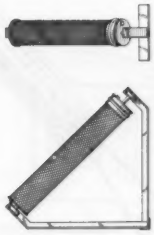


238,188
CIGARETTE LIGHTER
Alain Carré, Paris, France, assignor to Waterman S.A., Paris, France
Filed July 17, 1974, Ser. No. 489,269
Claims priority, application France Apr. 10, 1974
Term of patent 14 years
Int. Cl. D9—*03;* D27—*05*
U.S. Cl. D27—36



238,189
MEDICATED COLLAR FOR PETS
Barbara Jean Doria, Greece, N.Y., assignor to Aceline Products Corporation, Rochester, N.Y.
Filed Aug. 2, 1974, Ser. No. 494,175
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38

238,190
COMBINED ANIMAL OILER AND SCRATCHER
George W. Keene, P.O. Box 395, Rochelle, Ill. 61068
Filed Oct. 16, 1974, Ser. No. 515,083
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



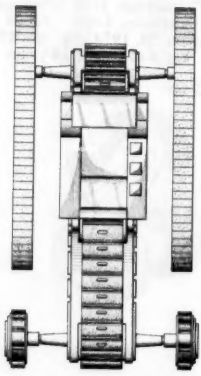
238,191
CHEERLEADER DOLL
Joyce McClanahan and Dawson G. McClanahan, both of 4 Sayers Drive, Williamstown, Ky. 41097
Filed July 1, 1974, Ser. No. 484,718
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R

238,192
DOUBLE-HEADED BOWLING PIN
Carl C. Jennings, 3107 Graciosa Lane, Anaheim, Calif. 92804
Filed June 14, 1974, Ser. No. 479,623
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 GP

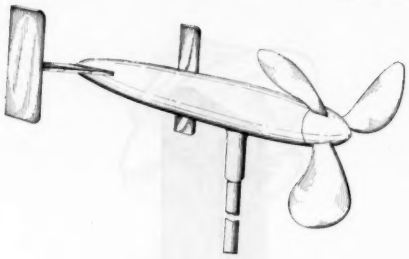
238,193
GRIP COVER FOR TENNIS RACKET
Manabu Toyosawa, % Daiya Sangyo Kabushiki Kaisha, 2–2–4 Nakano, Nakano-ku, Tokyo, Japan
Filed Nov. 7, 1974, Ser. No. 521,569
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST

238,194
TOY HAMMER
Matthew Moustakas, Mercerville, N.J., assignor to CBS Inc., New York, N.Y.
Filed Feb. 19, 1974, Ser. No. 443,230
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 E

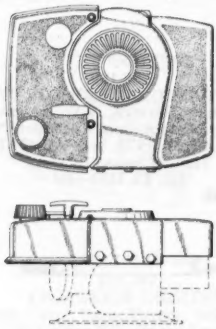
238,195
TOY VEHICLE
Howard J. Morrison, Deerfield, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 23, 1974, Ser. No. 435,639
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



238,196
WIND VANE
Alden H. Simpson, 54 Pine Grove St. Springfield, Mass. 01119
Filed Sept. 18, 1974, Ser. No. 507,012
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D35—1



238,197
SHROUDING FOR LAWN MOWER ENGINE
Mario F. Fernandez, Minneapolis, Minn., assignor to The Toro Company, Minneapolis, Minn.
Filed Aug. 9, 1974, Ser. No. 496,133
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1 B

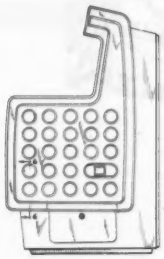


238,198
PENDANT
Marcia Bell Fear, Youngstown, Ohio, assignor to Marcia Bell Fear, Youngstown, Ohio
Filed June 10, 1974, Ser. No. 478,154
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—16 B

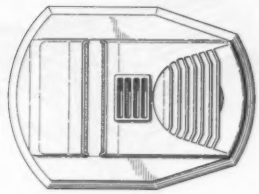
238,199
POST
Amnon Michaeli, 135—03 73rd Terrace, Kew Gardens Hills, Queens, N.Y. 11415
Filed Sept. 16, 1974, Ser. No. 506,410
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R

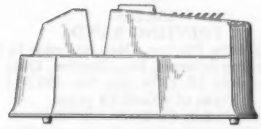
238,200
PHONOGRAPH
Melvin H. Boldt, Glenview, Ill., assignor to Rowe International, Inc., Whippany, N.J.
Filed June 21, 1973, Ser. No. 372,081
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

238,201
PHONOGRAPH
Melvin H. Boldt, Glenview, Ill., assignor to Rowe International, Inc., Whippany, N.J.
Filed June 21, 1973, Ser. No. 372,082
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4 R

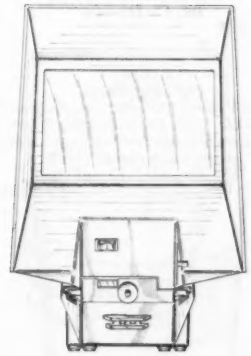


238,202
OPHTHALMIC FRAME WARMER
Edward A. Ebert, 203 Huxley Drive, Snyder, N.Y. 14226
Filed June 3, 1974, Ser. No. 475,501
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 R

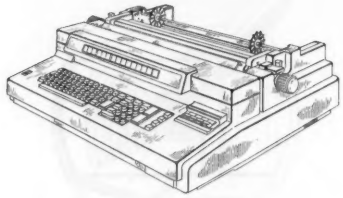




238,203
MICROFILM READER
Ralph M. Vigna, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Feb. 1, 1974, Ser. No. 438,823
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

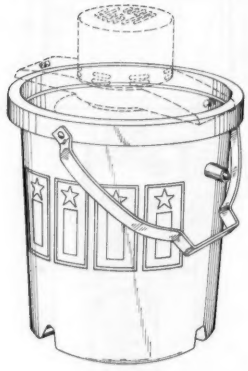


238,204
DESK TOP ACCOUNTING MACHINE
Ettore Sottsass, Jr., Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed June 11, 1974, Ser. No. 478,267
Claims priority, application Italy Dec. 17, 1973
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

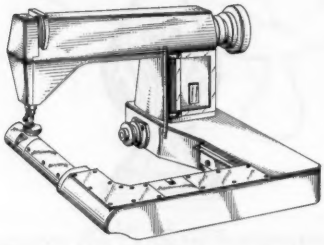


238,205
PRINTING BAND
Robert M. Pabodie, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed July 25, 1974, Ser. No. 491,911
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10

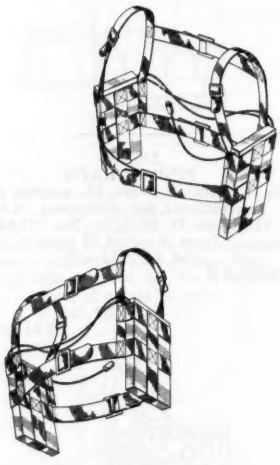
238,206
ICE CREAM FREEZER CONTAINER
Bruce A. Claxton, Philadelphia, Pa., assignor to SCM Corporation, New York, N.Y.
Filed Sept. 24, 1973, Ser. No. 400,308
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D67—2 R



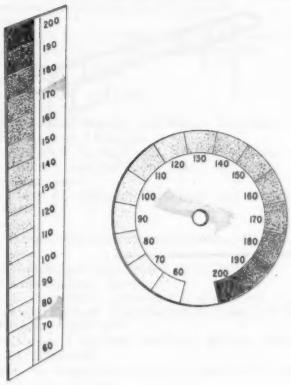
238,207
FRAME OF A SEWING MACHINE OR SIMILAR ARTICLE
Douglas J. Fox, Leeds, England, assignor to The Singer Company, New York, N.Y.
Filed July 15, 1974, Ser. No. 488,356
Claims priority, application Great Britain Feb. 5, 1974
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1



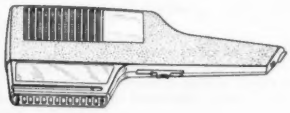
238,208
ELECTROCARDIOGRAPHIC RECORDING HOLSTER
Joseph A. Hesen, Torrance, Calif., assignor to Cardiac Scan Service, Inc., Los Angeles, Calif.
Filed May 28, 1974, Ser. No. 473,815
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



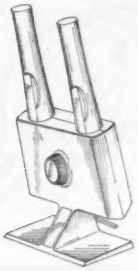
238,209
SPHYGMOMANOMETER DIAL FACE
Merton J. Alexander, 173 Highland Place, Monrovia, Calif. 91016
Filed Dec. 6, 1974, Ser. No. 530,204
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D83—1 F



238,210
HAIR STYLER
Douglas G. Long, Lombard, and Augusto Argandona, Lisle, Ill., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 16, 1974, Ser. No. 433,929
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F

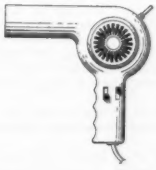


238,211
COMBINED HAIR CURLING IRONS AND HEATING UNIT THEREFOR
Robert S. Waters and Meyric K. Rogers, Lancaster, Pa., assignors to Schick, Incorporated, Los Angeles, Calif.
Filed June 24, 1974, Ser. No. 482,021
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

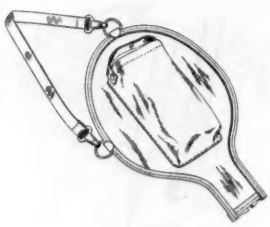


238,212
COSMETIC APPLICATOR
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed Mar. 15, 1974, Ser. No. 451,650
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 A

238,213
HAIR DRYER
Evan R. Kahn, 808 NE. 160th Terrace, North Miami Beach, Fla. 33162
Filed June 28, 1974, Ser. No. 484,457
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 F



238,214
TENNIS RACKET JACKET
Robert J. Rivera, 424 Atlantic Ave., Brooklyn, N.Y. 11217
Filed Aug. 15, 1973, Ser. No. 388,424
Term of patent 14 years
The term of this patent subsequent to June 17, 1989, has been disclaimed
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



238,215
CAROUSEL ADVERTISING SIGN DISPLAY FOR STORES
John J. Casparro, Canoga Park, Calif., assignor to Don Fedderson Productions Inc., Studio City, Calif.
Filed May 10, 1974, Ser. No. 468,908
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Curtin, Denis J., 3,928,035.

A. H. Robins Company, Incorporated: *See—*
Welstead, William John, Jr., 3,928,426.
Welstead, William John, Jr., 3,928,625.

A-T-O Inc.: *See—*
Harkison, Norman W., 3,927,539.

Aagaard, Einar Andreas; Coenders, Johannes Wilhelmus; and Dijkmans, Eise Carel, to U.S. Philips Corporation. Matrix module and switching network. 3,928,730, Cl. 179-18.0GF.

AB Bofors: *See—*
Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, 3,928,326.
Eriksson, Carl-Erik, 3,927,598.

AB Inventing: *See—*
Wallsten, Hans Ivar, 3,927,464.

Abbott Laboratories: *See—*
Chittenden, Richard Marion; and Wilson, Earl David, 3,927,671.
Prasad, Raj Nandan, 3,928,582.

Abd-Alla, Ahmed M. E., to Big Drum, Inc. Feeder, shearer and applicator for a strip of connected paper caps. 3,927,506, Cl. 53-41.000.

Abdullah, Mukhtar: *See—*
Freeman, Jere E.; Abdullah, Mukhtar; and Bocan, Byron J., 3,928,631.

Abe, Chiyoji: *See—*
Homma, Yuzuru; Abe, Chiyoji; and Shionoya, Hiroshi, 3,928,565.

Abe, Hideo: *See—*
Harada, Shunichi; and Abe, Hideo, 3,927,460.

Ablad, Bengt Arne-Hjalmar: *See—*
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; and Ablad, Bengt Arne-Hjalmar, 3,928,601.

Aboud, Fred George. Containers for waste for use with trash bags. 3,927,786, Cl. 220-4.00R.

Abrams, Ralph, to Coto-Coil Co., Inc. Reed relay construction. 3,928,829, Cl. 335-151.000.

Acron Corporation: *See—*
Cohen, Herbert I., 3,928,731.

Adachi, Yoshiharu, to Aisin Seiki Kabushiki Kaisha. Vehicle anti-lock brake system with booster device. 3,927,915, Cl. 303-21.00F.

Adams, John M.: *See—*
Gobeli, David H.; and Adams, John M., 3,927,677.

Adams, Maurice L., Jr.; and Raimondi, Albert A., to Westinghouse Electric Corporation. Rotating element fluid seal for centrifugal compressor. 3,927,889, Cl. 277-25.000.

Adams, Maurice L., Jr., to Westinghouse Electric Corporation. Rotating element fluid seal for centrifugal compressor. 3,927,890, Cl. 277-29.000.

Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, to American Cyanamid Company. 2-Imino-1,3-dithietane. 3,928,382, Cl. 260-327.00M.

Addressograph Multigraph Corporation: *See—*
Nantz, Jack George, 3,927,613.

Adicoff, Arnold; and Murbach, Warren J., to United States of America, Navy. Method of making a poly(methyl methacrylate) preholographic element. 3,928,108, Cl. 156-246.000.

Adler, Karl-Heinz: *See—*
van der Kolk, Hans-Jurgen; Mindner, Reinhard; Kiess, Tilman; Muhlich, Peter; Aldinger, Ulrich; and Adler, Karl-Heinz, 3,927,528.

Adolf Friz Gesellschaft mit beschrankter Haftung: *See—*
Friz, Helmut A.; and Grube, Dieter, 3,927,612.

Adolph's Ltd.: *See—*
Rigler, Lloyd E.; Taki, Ghazi H.; and Spirtos, Nicholas G., 3,928,252.

AEG-Elotherm G.m.b.H.: *See—*
Seulen, Gerhard; Reinke, Friedhelm; and Stengel, Edgar, 3,927,870.

Aerojet-General Corporation: *See—*
Katzakian, Arthur, Jr.; and Depree, David O., 3,928,192.

Ag-Chem Equipment Co., Inc.: *See—*
Robison, William G.; and Bieker, Ronald D., 3,927,832.

Agency of Industrial Science & Technology: *See—*
Itoh, Hideyo, 3,927,424.

Agfa-Gevaert N.V.: *See—*
De Haes, Louis Maria; and Volz, Hans-Georg, 3,928,037.
Poot, Albert Lucien; Heugebaert, Frans Clement; Janssens, Wilhelmus; and Vandenberghe, Antoon Leon, 3,928,686.

Agnew, Marc N.: *See—*
Bauer, Victor J.; Agnew, Marc N.; and Effland, Richard C., 3,928,378.

Agren, Nils Axel, to Atlas Copco Aktiebolag. Pressure fluid valve having fully opened, fully closed and restricted flow positions. 3,927,690, Cl. 137-599.200.

Ahr, Robert L.: *See—*
Rhodes, Philip H.; and Ahr, Robert L., 3,928,267.

Ahrenkiel, Richard K.; and Coburn, Theodore J., to Eastman Kodak Company. Magneto-optical processes and elements using tetrahedrally coordinated divalent cobalt-containing magnetic material. 3,928,870, Cl. 360-59.000.

Aiba, Takaaki: *See—*
Takahashi, Ryoichi; Hosoi, Takuji; Aiba, Takaaki; and Konno, Tsutomu, 3,928,170.

Aicher, Albrecht; Diem, Hans; Haas, Hans; Hess, Klaus; Hussy, Oskar; Matthias, Guenther; Sperber, Heinrich; and Stickel, Richard, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of combustion gas to heat silver catalyst. 3,928,460, Cl. 260-603.00C.

Aicher, Albrecht: *See—*
Diem, Hans; Matthias, Guenther; Aicher, Albrecht; Haas, Hans; Schreiber, Hans; and Sperber, Heinrich, 3,928,461.

Aihara, Shinji: *See—*
Ooka, Takayuki; and Aihara, Shinji, 3,927,732.

Aine, Harry Eugene. Swimming pool cover. 3,927,427, Cl. 4-172.140.

Air Products and Chemicals, Inc.: *See—*
Bligh, Bernard Ramsay; and Allam, John, 3,928,004.

Airco, Inc.: *See—*
Kirk, Bradley S.; and Chappel, Raymond M., 3,928,199.

Airlite Aluminum Corporation: *See—*
Rosalsky, Ivan, 3,927,466.

Aisin Seiki Kabushiki Kaisha: *See—*
Adachi, Yoshiharu, 3,927,915.

Ajiki, Ryogo: *See—*
Kamada, Sueo; Yamashita, Takeshi; Ide, Tohru; Ajiki, Ryogo; and Kitamura, Takao, 3,928,444.

Ajinomoto Co., Inc.: *See—*
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Akey, John G.: *See—*
Wachter, William J.; and Akey, John G., 3,928,131.

Akins, Eugene T.: *See—*
Wilson, Robert W.; and Akins, Eugene T., 3,927,683.

Akiyama, Keiiti; Suzuki, Shyuichi; and Mikogami, Yukihiro, to Tokyo Shibaura Electric Co., Ltd. Heat-resistant adhesive composition from a bis-malcimide, an alpha-cyanoacrylate and optionally a diamine. 3,928,286, Cl. 260-47.0UA.

Aktiebolaget Hassle: *See—*
Berntsson, Peder Bernhard; Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, 3,928,369.
Berntsson, Peder Bernhard; Carlson, Per Arvid Emil; and Corrodi, Hans Rudolf, 3,928,613.
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; and Ablad, Bengt Arne-Hjalmar, 3,928,601.

Aktiebolaget Svenska Flaktfabriken: *See—*
Strindehag, Ove, 3,927,827.

A.G. fur industrielle Elektronik AGIE Losone b. Locarno: *See—*
Ullmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, 3,928,163.

Alaburda, Raymond Daniel, to Du Pont de Nemours, E. I., and Company. Melt coating with alkali metals. 3,928,681, Cl. 427-431.000.

Albright & Wilson Limited: *See—*
Collins, John D.; Coates, Harold; and Siddiqui, Iftikhar Hussain, 3,928,284.

Alburger, James R. Fractured glass testing panel for dyed liquid penetrants. 3,927,551, Cl. 73-1.00R.

Alburger, James R. Brightener additive for inspection penetrant developers. 3,928,046, Cl. 106-19.000.

Alder, Peter James: *See—*
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Alderson, John M.; and Heiskell, Raymond H. Dry cleaning finishing method and apparatus. 3,928,660, Cl. 427-248.000.

Aldinger, Ulrich: *See—*
van der Kolk, Hans-Jurgen; Mindner, Reinhard; Kiess, Tilman; Muhlich, Peter; Aldinger, Ulrich; and Adler, Karl-Heinz, 3,927,528.

Alexander, Robert L.: *See—*
Herrmann, John R.; and Alexander, Robert L., 3,927,950.

Alexander, Roy P., to Olin Corporation. Preparation of low friability rigid polyurethane foam. 3,928,258, Cl. 260-2.5AS.

Alexander, William J., III: *See—*
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Johansson, Bjorn-Olow; and Palm, Bengt Arne, 3,927,974.

Aliberti, Vincent A., to Monsanto Company. Polyblend of two types of ABS graft polymers and a copolymer matrix. 3,928,494, Cl. 260-876.00R.

Allain, Ronald J.; and Seale, Virgil L., to Nalco Chemical Company. Acrylonitrile hydrolysis and catalyst useful therefor. 3,928,440, Cl. 260-561.00N.

Allain, Ronald J.; and Seale, Virgil L., to Nalco Chemical Company. Copper catalyst and processes for making and using. 3,928,443, Cl. 260-561.00N.

Allain, Ronald J.: *See—*
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Allam, John: *See—*
Bligh, Bernard Ramsay; and Allam, John, 3,928,004.

Allen, Herman C.; and Patenaude, Clifford J., to Bird & Son, Inc. Random pattern shingle. 3,927,501, Cl. 52-555.000.

Allen, Ira R. Patient self-transporter. 3,927,430, Cl. 5-81.00R.

Allied Chemical Corporation: *See—*
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Broms, Anders; and Frank, Kjell, 3,928,794.
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Larker, Hans; and Nilsson, Jan, 3,927,891.
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Alsch, Gottfried, to Hubert Laurenz Naimer. Rotary switch. 3,928,740, Cl. 200-153.0LB.

Alsop, Derek J., to Moore Business Forms, Inc. 1-Hydroxy-1-(4-aminophenyl polymethine) naphthalan compounds and pressure-sensitive recording system therewith. 3,928,685, Cl. 428-411.000.

Aluminum Company of America: *See—*
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Amchem Products, Inc.: *See—*
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American Aniline Products, Inc.: *See—*
Botros, Raouf, 3,927,964.

American Bottlers Equipment Company: *See—*
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American Cyanamid Company: *See—*
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 3,928,382.
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American Fitness, Inc.: *See—*
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American Hoechst Corporation: *See—*
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American Home Products Corporation: *See—*
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Greenspan, George; and Leeming, Michael R. G., 3,928,134.
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American Institute of Physics: *See—*
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American Standard, Inc.: *See—*
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American Tractor Equipment Corporation: *See—*
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Ampaglas S.p.A.: *See—*
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Ancker, Fred Harpoth: *See—*
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Andersen, Byram, Kouma, Murphy, Lockard & Carney: *See—*
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Anderson, Lydia H.: *See—*
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Anderson, Norman G.; and Caton, John E., Jr., to United States of America, Health, Education and Welfare. Rotor for centrifugal testing of electrophoresis gel. 3,927,826, Cl. 233-11.000.

Anderson, Norman J.; and Mancusco, Jon R., to Zurn Industries, Inc. Overload coupling. 3,927,537, Cl. 64-28.000.

Anderson, Wilbur R.; and Anderson, Lydia H. Overhead garage door. 3,927,709, Cl. 160-37.000.

Ando, Masasi: *See—*
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Andrade, Eugen J.; and Andrade, Eugene J. Container having controlled access to the interior thereof. 3,927,792, Cl. 220-210.000.

Andrade, Eugene J.: *See—*
Andrade, Eugen J.; and Andrade, Eugene J., 3,927,792.

Andrews, Daniel Marshall: *See—*
Redmond, John Peter; Andrews, Daniel Marshall; Brooks, Charles Parsons; Cinalli, Dominic A.; and Merlina, Joseph Francis, 3,928,663.

Andrews, James D., to TRW Inc. Electrochemical radius generation. 3,928,154, Cl. 204-129.500.

Angell, James B., to Fairchild Camera and Instrument Corporation. Method of aligning a wafer beneath a mask and system therefor and wafer having a unique alignment pattern. 3,928,094, Cl. 148-187.000.

Anschutz, Wayne H. Egg handling apparatus. 3,928,184, Cl. 209-74.00R.

Anselmino, Luigi: *See—*
Vannini, Paolo; Anselmino, Luigi; and Frazzini, Giuseppe, 3,928,780.

Anthony, Michael P.; Gunsagar, Kamleshwar; Kim, Choong-Ki; and Walsh, Lloyd R., to Fairchild Camera and Instrument Corporation. Self aligned CCD element fabrication method therefor. 3,927,468, Cl. 29-578.000.

Anthony, Wilson B., to Firewood, Inc. Process of treating wood. 3,928,677, Cl. 427-374.000.

Anzai, Masayasu, to Hitachi, Ltd. Colour electrophotographic method in which the recording sheet is charged to its saturation voltage. 3,928,033, Cl. 96-1.200.

Anzini, Renato, to Ampaglas S.p.A. Rope stretcher provided with improved unclamping device. 3,927,441, Cl. 24-136.000.

Aoki, Susumu: *See—*
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Aoyagi, Takanobu: *See—*
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Appleton, Thomas R.; Dean, Richard H.; Hillman, Edward J.; Nelson, Charles J.; and Sinn, Gunter E., to Sperry Rand Corporation. Process for providing a hard coating to magnetic transducing heads. 3,928,672, Cl. 427-127.000.

Applied Power Inc.: *See—*
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Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Yokota, Yukio; Tanaka, Mitsugu; and Inouye, Kozo, to Fuji Photo Film Co., Ltd. Magenta coupler-containing photographic silver halide materials. 3,928,044, Cl. 96-100.000.

Arai, Kiyoyuki; and Kikuchi, Tomio, to Copal Company Limited. Operation condition detecting and displaying device. 3,928,846, Cl. 340-325.000.

Arakawa Rinsan Kagaku Kogyo Kabushiki Kaisha: *See—*
Shimizu, Katsuhisa; Ishibe, Shuhei; Okumichi, Toshiharu; and Matsumoto, Keizo, 3,928,414.

Araki, Kengo: *See—*
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Archer, Robert A., to Eli Lilly and Company. Hexahydro-dibenzo[b,d]pyran-9-ones as an anti-anxiety drug. 3,928,598, Cl. 424-283.000.

Arconti, Richard J.; and Pierson, Robert M., to Goodyear Tire & Rubber Company, The. Film bonding using a solvent saturated cloth wick. 3,928,110, Cl. 156-308.000.

Aritaki, Hirakazu: *See—*
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Armco Steel Corporation: *See—*
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Armour Pharmaceutical Company: *See—*
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Armstrong Cork Company: *See—*
Davey, John R., 3,927,706.
Kauffman, William J., 3,928,343.

Armstrong, David Alun; and Lewis, Kenneth Gill, to British Steel Corporation. Strip shape correction on galvanising line. 3,928,657, Cl. 427-47.000.

Arnblock, Lennart Oswald, to Flymo Societe Anonyme. Grass-cutting devices. 3,927,510, Cl. 56-12.800.

Arnold, Francis T.: *See—*
Freeman, Lawrence M.; and Arnold, Francis T., 3,927,935.

Arnold, Raymond Mills; Neaves, Eric Henry Francis; and Phillips, Leslie John, to Letraset International Limited. Heat activated transfers. 3,928,710, Cl. 428-483.000.

Aronson, Robert R., to Electric Fuel Propulsion Incorporated. Pancake battery. 3,928,080, Cl. 136-160.000.

Artos Engineering Company: *See—*
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Arvin, John R.; Sullivan, Robert E.; and Troth, Dennis L., to General Motors Corporation. Combustion apparatus with combustion and dilution air modulating means. 3,927,520, Cl. 60-39.230.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kamada, Sueo; Yamashita, Takeshi; Ide, Tohru; Ajiki, Ryogo; and Kitamura, Takao, 3,928,444.
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Aseeva, Roza Mikhailovna: *See—*
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Ash, John F.: *See—*
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Ashikaga, Tadao; Ohmori, Akio; and Ando, Masasi, to Kuraray Co. Ltd. PVA–PVC fibers and process for their production. 3,928,261,Cl. 260/45.75K.
Ashland Oil, Inc.: *See—*
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Ashworth, John W., III: *See—*
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Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, 3,928,581.
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Ateliers de Constructions Electriques de Charleroi (ACEC): *See—*
Fagel, Roger, 3,927,910.
Athey, Stuart E., to Hobart Corporation. Temperature indicating device. 3,927,571, Cl. 73-362.000.
Atkinson, John Halstead, to Imperial Chemical Industries Limited. Process for the preparation of substituted cyclohexadienones. 3,928,453, Cl. 260-586.00R.
Atlantic Richfield Company: *See—*
Shalit, Harold, 3,928,473.
Atlas Copco Aktiebolag: *See—*
Agren, Nils Axel, 3,927,690.
Atsumi, Minoru; and Shishido, Toshimasa, to Honda Giken Kogyo Kabushiki Kaisha. Choke valve assembly. 3,928,511, Cl. 261-64.00C.
Audran, Roger G. L.; and Pinguad, Bernard J., to Eastman Kodak Company. Ferrous ferric oxides, process for preparing same and their use in magnetic recording. 3,928,709, Cl. 428-539.000.
August Bilstein, Firma: *See—*
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Aumuller, Walter: *See—*
Weyer, Rudy; Aumuller, Walter; Weber, Helmut; Schweitzer, Roland; and Heerdt, Ruth, 3,928,610.
Auray, Didier. Device for calculating the successive derivatives of a function of a variable. 3,928,756, Cl. 235-183.000.
Ausherman, William S. Threshing cylinder and rasp bar thereof. 3,927,679, Cl. 130-27.0HA.
Austin, Michael L. Dispenser for flowable particulate material. 3,927,807, Cl. 222-430.000.
Austin, Richard Arnold. Adjustable liner. 3,927,585, Cl. 82-38.00A.
Avoset Food Corporation: *See—*
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Awane, Yasushi; Otsuka, Sadao; Nagata, Masao; and Tanaka, Fumio, to Mitsubishi Gas Chemical Co., Ltd. Process for the continuous production of highly pure sodium formate. 3,928,435, Cl. 260-542.000.
Awano, Tsuneo: *See—*
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Axelrod, Sydney; and Brenner, Walter, to United States of America, Army. Combustible cartridge case. 3,927,616, Cl. 102-43.00R.
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Ayerst Mckenna and Harrison Ltd.: *See—*
Kluepfel, Dieter; Kudelski, Alicia; and Bagli, Jehan, 3,928,572.
Aylon, Norman N., to General Concrete of Canada Limited. Apparatus for building of structural components. 3,928,114, Cl. 156-351.000.
Aylor, Robert Benson: *See—*
Bolich, Raymond Edward, Jr.; and Aylor, Robert Benson, 3,928,251.
Aziende Colori Nazionali Affini ACNA S.p.A: *See—*
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Aziende Colori Nazionali Affini ACNA S.p.A.: *See—*
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Azrak, Raymond George; Ancker, Fred Harpoth; and Bertolucci, Michael Dean, to Union Carbide Corporation. Coupling agents for chrysotile asbestos and thermoplastic polymers. 3,928,278, Cl. 260-40.00R.
B.F. Goodrich Company, The: *See—*
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Babcock & Wilcox Company: *See—*
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Aicher, Albrecht; Diem, Hans; Haas, Hans; Hess, Klaus; Hussy, Oskar; Matthias, Guenther; Sperber, Heinrich; and Stickel, Richard, 3,928,460.
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Bailey, Edwin M.; and Bailey, David Y. Heating system. 3,927,831, Cl. 237-9.00R.
Bailey, Raymond E.: *See—*
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Bakay, Carl James, to Union Carbide Corporation. Process for the preparation of anion exchange resin for use in the redistribution of chlorosilanes. 3,928,542, Cl. 423-342.000.
Baker, Charles J., to Royal Industries, Inc. Load cell retaining apparatus for on-board vehicle weighing systems. 3,927,724, Cl. 177-136.000.
Bakker, Herman F.; and Bell, Malcolm C., to International Nickel Company, Inc., The. Selective precipitation of cobalt and nickel amine complexes. 3,928,530, Cl. 423-140.000.
Baldwin, John J.; and Novello, Frederick C., to Merck & Co., Inc. 1-(Sulfamoylphenylalkyl)-3,5-dipyridyl-1,2,4 triazoles. 3,928,361, Cl. 260-294.80F.
Baldwin, Mildred. Composition and method for treating fingernails and toenails. 3,928,561, Cl. 424-61.000.
Ball Brothers Research Corporation: *See—*
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Ballamy, William Charles; and Cho, Alfred Yi, to Bell Telephone Laboratories, Incorporated. Simultaneous molecular beam deposition of monocrystalline and polycrystalline III(a)-V(a) compounds to produce semiconductor devices. 3,928,092, Cl. 148-175.000.
Ballweber, Edward G.; Tai, Wun Ten; and Selvarajan, Radhakrishnan, to Nalco Chemical Company. Dichlorobutene/dimethylamine ionene polymer. 3,928,448, Cl. 260-567.60P.
Bangerskis, Karlis L.: *See—*
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Banville, Jules Eugene. Supervisory control system. 3,928,848, Cl. 340-409.000.
Barker, A. Clifford, to Navidyne Corporation. Radio navigation system and apparatus. 3,928,852, Cl. 343-105.00R.
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Barthold, Dag Vilhelm; Dahlbom, Johan Richard; Magnusson, Harry Olof; and Sjoberg, Berndt Olof Harald, to Astra Lakemedel Aktiebolag. Substituted phenoxymalonic acids, esters thereof and hypolipaemic agents containing the same for lowering lipid levels. 3,928,602, Cl. 424-308.000.
BASF Aktiengesellschaft: *See—*
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Ciko, John D.; and Cramer, John J., 3,927,970.
Bass, Dieter, to Canada Wire and Cable Limited. Consumable fuel element for battery applications. 3,928,075, Cl. 136-100.00R.
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Bates, Harry Eugene. Optical coherence and wavelength measurement. 3,927,945, Cl. 356-106.000.
Bates, Roger D., to Xerox Corporation. Programmable bit clock oscillator for controlling the processing of binary digits. 3,928,812, Cl. 331-1.00A.
Bauer, Jakob: *See—*
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Bauer, Victor J.; Agnew, Marc N.; and Effland, Richard C., to American Hoechst Corporation. Fused bicyclic aminopyrazoles. 3,928,378, Cl. 260-310.00R.

Bauerschmidt, Eberhard; Bormann, Dieter; and Worm, Manfred; to Hoechst Aktiengesellschaft. Process for the manufacture of 7-amino-3-cephem-4-carboxylic acid derivatives. 3,928,331, Cl. 260-243.00C.

Baugesellschaft Klammt KG: *See*—
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Bauman, Robert Andrew, to Colgate-Palmolive Company. New quaternary compounds having anti-microbial activity. 3,928,411, Cl. 260-468.00G.

Bauman, Robert Andrew, to Colgate-Palmolive Company. Oral compositions. 3,928,618, Cl. 424-311.000.

Baumann, Rudi: *See*—
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Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, to Heraeus-Schott Quarzschmelze GmbH. Quartz glass elements. 3,927,697, Cl. 138-145.000.

Baxter, Alexander Samuel. Methods of and means for vacuum deposition. 3,928,659, Cl. 427-132.000.

Baxter Laboratories, Inc.: *See*—
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Baxter, William E.: *See*—
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Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., to Rohm & Haas Company. Herbicidal 4-trifluoromethyl-4'nitrodiphenyl ethers. 3,928,416, Cl. 260-471.00R.

Beal, Glenn L., to R. M. Smith, Inc. Article and card package and fastening means therefor. 3,927,765, Cl. 206-481.000.

Beale, Alvin F., Jr.; and Lee, John M., to Dow Chemical Company, The. Process for preparation of urea autocondensation product. 3,928,438, Cl. 260-553.00B.

Beall, George H.; Miller, David M.; and Rittler, Hermann L., to Corning Glass Works. Base metal titanate catalysts. 3,928,533, Cl. 423-213.200.

Beaubien, Everett E., to Twin Tool, Inc. Movable extension for a funnel. 3,927,703, Cl. 141-333.000.

Bebin, Jean Louis, to Degremont, Societe Generale d'Epuration et d'Assainissement. Method of biological purification of sewage. 3,928,190, Cl. 210-8.000.

Becher, Heinz Manfred; and Sehring, Richard, to Celamerck GmbH & Co. KG. Process for preparation of 2-methoxy-3,6-dichloro-benzoic acid. 3,928,432, Cl. 260-521.00H.

Beck, Gerhard; and Gunther, Dieter, to Hoechst Aktiengesellschaft. 1,2,3-Triazoles. 3,928,373, Cl. 260-307.00D.

Behrakis, George D., to Dooner Laboratories, Inc. Non-alcoholic theophylline product. 3,928,609, Cl. 424-253.000.

Beier, Helmut; and Noack, Dieter, to Siemens Aktiengesellschaft. Coupling arrangement for a compressed-gas circuit breaker equipped with a hydraulic drive. 3,928,738, Cl. 200-82.00B.

Belasco, Irvin Joseph, to Du Pont de Nemours, E. I., and Company. Biodegradation of methanolic waste water. 3,928,191, Cl. 210-12.000.

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Bellamy, Lester Ralph; and Hotaling, Kenneth LeGrand, to International Business Machines Corporation. Diagnostic system for field replaceable units. 3,928,830, Cl. 235-153.0AK.

Bellanger, Maurice Georges; Lepagnol, Guy Pierre; and Daguet, Jacques Lucien, to Telecommunications Radioelectriques et Telephoniques T.R.T. Low pass nonrecusine digital filter. 3,928,755, Cl. 235-152.000.

Bemiss, Robert P. Method of forming, filling and closing cartons, and specific cartons therefor. 3,927,505, Cl. 53-37.000.

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Bergdahl, Sven-Gunnar; and Wangdahl, Erik Torsten, to Allmanna Svenska Elektriska Aktiebolaget. Method of supervising the filling level in hoppers, shafts, silos and the like for miscellaneous materials and means for performing the method. 3,927,569, Cl. 73-290.00V.

Berger, Herbert; Gall, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede, to Boehringer Mannheim G.m.b.H. Nitrofuryltriazolo(4,3-b)pyridazine compounds and bacteriostatic compositions. 3,928,342, Cl. 260-247.5EP.

Berger, Herbert; Gall, Rudi; Stach, Kurt; Vomel, Wolfgang; and Hoffmann, Rita, to Boehringer Mannheim G.m.b.H. Nitroimidazolyltriazolo-pyridazine compounds. 3,928,349, Cl. 260-250.0AC.

Bergin, Michael J., to Intaglio Service Corporation. Process for making multi-color intaglio plates and cylinders for use in gravure printing. 3,928,038, Cl. 96-38.000.

Bergles, Eduard, to Fichtel & Sachs A.G. Disc brake for a bicycle and like vehicle. 3,927,736, Cl. 188-26.000.

Bergles, Eduard, to Fichtel & Sachs A.G. Rear derailleur for a bicycle. 3,927,904, Cl. 280-236.000.

Berlin, Alfred Anisimovich; Aseeva, Roza Mikhailovna; Mezhikovsky, Semen Markovich; Sherle, Alla Ilinichna; Tsepalova, Nadezhda Alexeevna; Goldovsky, Evgeny Alexandrovich; Zelenetskaya, Tatiana Vladimirovna; Fatkulina, Rozalia Komalovna; and Kuzminsky, Alexandr Samoilovich. Method for increasing the thermostability of organopolysiloxanes. 3,928,489, Cl. 260-827.000.

Berman, Herbert L.: *See*—
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Bernstein, Daniel, to United States of America, Air Force. Laser power supply. 3,928,819, Cl. 331-94.5PE.

Bernstein, Lawrence A. Ring elements, channel elements, and connectors for joining same. 3,927,489, Cl. 46-29.000.

Berntsson, Peder Bernhard; Carlsson, Per Arvid Emil; and Corrodi, Hans Rudolf, to Aktiebolaget Hassle. Compounds useful as antidepressive agents, and a process for their preparation. 3,928,369, Cl. 260-296.00R.

Berntsson, Peder Bernhard; Carlson, Per Arvid Emil; and Corrodi, Hans Rudolf, to Aktiebolaget Hassle. Compounds useful as antidepressive agents. 3,928,613, Cl. 424-263.000.

Berthoud, Francois, to Societe Suisse pour l'Industrie Horlogere Management Services SA. Timepiece movement with a timer mechanism. 3,927,519, Cl. 58-76.000.

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Bialek, Francis J. Automobile bumper. 3,927,907, Cl. 293-71.00R.

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Bickling, Archie L., Jr.: *See*—
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Bilow, Norman; Boschan, Robert H.; and Landis, Abraham L., to Hughes Aircraft Company. Acetylene substituted aromatic primary amines and the process of making them. 3,928,450, Cl. 260-571.000.
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Blackwood, William A. Rotary internal combustion engine. 3,927,647, Cl. 123-43.00C.
Blake, Floyd A.; and Howerton, Murlin T., to Martin Marietta Corporation. Peak efficiency solar energy powered boiler and superheater. 3,927,659, Cl. 126-271.000.
Blake, Melvyn, to Norton Company. Flexible tape fastener or hinge. 3,927,438, Cl. 16-150.000.
Blankenburg, Carl-Heinrich Teodor, to Wikstrom International AB. Apparatus for lifting of heavy loads. 3,927,865, Cl. 254-105.000.
Bligh, Bernard Ramsay; and Allam, John, to Air Products and Chemicals, Inc. Purification of inert gases. 3,928,004, Cl. 55-66.000.
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Bock, Hartmut; and Gotte, Hans, to Hoechst Aktiengesellschaft. Method and apparatus for measuring and controlling the toner concentration in electrophotographic reproduction machines. 3,928,764, Cl. 250-272.000.
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Bogert, Clayton. Safety closure for containers. 3,927,783, Cl. 215-222.000.
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Boige, Jean. Process for the preparation of methylcobalamine. 3,928,320, Cl. 260-211.700.
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Bolsenga, Stanley J.; Kotow, Stephen S.; Reuter, Henry G.; and Volante, Donald J., to Apeco Corporation. Collator. 3,927,878, Cl. 271-173.000.
Bonacci, John C.; Ireland, Henry P.; and Stein, Thomas R., to Mobil Oil Corporation. Combination process for producing LPG and aromatic rich material from naphtha. 3,928,174, Cl. 208-80.000.
Bond, Robert W.; and Alexander, William J., III, to Bond Transmission & Controls, Inc. Cloth inspection device. 3,927,844, Cl. 242-55.000.
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Bontempi, Jules. Hair curler. 3,927,685, Cl. 132-40.000.
Booth, Robert Ben, to American Cyanamid Company. Leaching polyelectrolyte fluidized solids. 3,928,551, Cl. 423-659.000.
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Bough, Dale E., to TRW Inc. Vehicle steering apparatus. 3,927,899, Cl. 280-87.00A.
Bowers, William S., to United States of America, Agriculture. Certain terpenoid compounds for insect control. 3,928,619, Cl. 424-314.000.
Boyer, Nicodemus E., to Borg-Warner Corporation. Substituted norbornene compounds and their applications in thermoplastic polymer compositions. 3,928,507, Cl. 260-940.000.
Boyle, Daniel J., to Hoerner Waldorf Corporation. Display carton. 3,927,761, Cl. 206-45.140.
Brachert, Heinrich; Girke, Dieter; and Kleiss, Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the production of gudol powder utilizing reduction of moisture content. 3,928,514, Cl. 264-3.00B.
Bradley, Robert Auldom. Double tiered conveyor track and safety switch. 3,927,619, Cl. 104-130.000.
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, to Bell Telephone Laboratories, Incorporated. Apparatus for reducing rotation components in table translation. 3,927,939, Cl. 355-54.000.
Braginetz, Paul A., to Philip Morris Incorporated. Replaceable blade knife. 3,927,473, Cl. 30-125.000.
Brailsford, Sidney Frank; and McDonald, Donald Robson, to Reed Paper Group Limited. Method of preparing a coating composition. 3,928,055, Cl. 106-214.000.
Bramhill, Percy W., to H. H. Investments Limited. Apparatus for making cigarettes. 3,927,681, Cl. 131-70.000.
Brancato, Jack J.; and Herman, Daniel F., to N L Industries, Inc. Process of making urea-formaldehyde solid microspheres. 3,928,272, Cl. 260-29.40R.
Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; and Ablad, Bengt Arne-Hjalmar, to Aktiebolaget Hassle. Phenoxy-hydroxypropylamines, method and pharmaceutical preparations for treating cardiovascular diseases. 3,928,601, Cl. 424-300.000.
Brattsand, Ralph Lennart; Ekenstam, Bo Thuresson af; Claeson, Karl Goran; and Thalen, Bror Arne, to AB Bofors. Process for the separation of stereoisomeric mixtures into their components and components obtained hereby. 3,928,326, Cl. 260-239.55D.
Braun, Anton. Supercharged internal combustion engine. 3,927,530, Cl. 60-607.000.
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Bright, Thomas John Robert. Load storage system and apparatus therefor. 3,927,773, Cl. 214-16.40C.
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, to Betz Laboratories, Inc. Synergistic compositions containing 2,2-dibromo-3-nitrilopropionamide and 3,3,4,4-tetrachlorotetrahydrothiopene-1,1-dioxide and their use. 3,928,198, Cl. 210-62.000.
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Brownlow, James M.; Buchanan, Relva C.; and Tummala, Rao R., to International Business Machines Corporation. Dielectric glasses. 3,928,051, Cl. 106-53.000.

Brumlik, George C., to Ingrip Fasteners, Inc. Multi-element self-gripping devices with linguiform gripping tabs. 3,927,443, Cl. 24-204.000.

Brummett, Charles Roscoe; and Shaak, Ray Ned, to AMP Incorporated. Selective plating on non-metallic surfaces. 3,928,670, Cl. 427-53.000.

Brundage, Ruth Pauline; and Lesher, George Y., to Sterling Drug Inc. Preparation of 2-substituted-6-pyridyl-nicotinic acids. 3,928,366, Cl. 260-295.50R.

Brunette, Eugene J.; and Trosclair, Nathaniel D. Skyscraper escaper. 3,927,734, Cl. 182-193.000.

Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Jouffret, Michel, to Rhone-Poulenc S.A. Preparation of mixtures of ketones and of their corresponding alcohols. 3,928,452, Cl. 260-586.00R.

Brunn, Frederick Milton, to Foster Wheeler Energy Corporation. Steam generating system and method utilizing exhaust gas recirculation. 3,927,627, Cl. 110-49.00R.

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Bryce, William Dean; Pinker, Richard Alfred; and Turner, Brian Arthur, to Secretary of State for Defense in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, The. Aircraft gas turbine noise suppression. 3,927,522, Cl. 60-264.000.

Buchanan, Edward R.; and Tarshis, Lemuel A., to General Electric Company. Cobalt-tungsten high temperature eutectic alloy. 3,928,030, Cl. 75-170.000.

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Buisman, Anthonius Theodorus Maria, to U.S. Philips Corporation. Paper stacker. 3,927,874, Cl. 270-61.00F.

Bujas, Roko, to Commissariat a l'Energie Atomique. Annular fuel element for high-temperature reactors. 3,928,132, Cl. 176-83.000.

Buning, Robert; Loebler, Peter; and Trautvetter, Werner, to Dynamit Nobel Aktiengesellschaft. Strength characteristics of glass fiber reinforced vinyl chloride thermoplastics and chlorination products thereof. 3,928,684, Cl. 428-297.000.

Bunzli, Paul, to Hydrel A.G. Support and guide cage. 3,927,919, Cl. 308-6.00R.

Buoy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sertre, Bernard, to Rhone-Progil. Improvements in methods of producing electrolytic anode assemblies. 3,928,167, Cl. 204-286.000.

Burdyn, Ralph F.; Chang, Harry L.; and Foster, William R., to Mobil Oil Corporation. Alkaline waterflooding process. 3,927,716, Cl. 166-270.000.

Burgess, Fred M. Water powdered rotary brush. 3,927,434, Cl. 15-24.000.

Burgess Products Company Limited: *See*—
Jackson, Neville, 3,928,007.

Burke, Phillip J.: *See*—
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Burkin, Jury Alexandrovich: *See*—
Seleznev, Jury Emelyanovich; Burkin, Jury Alexandrovich; and Kuzmin, Sergei Vladimirovich, 3,927,455.

Burleigh, John E.: *See*—
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Burmah Oil Trading Limited: *See*—
Field, Peter Graham Spencer; and Lock, David Anthony, 3,928,477.

Burns, Henry C.; and McConnell, George C., to Chromalloy Pharmaceutical, Inc. Composition for control of white muscle disease. 3,928,578, Cl. 424-164.000.

Burrell, Raymond Alexander: *See*—
Cox, John Michael; and Burrell, Raymond Alexander, 3,928,608.

Burris, Bobby V.: *See*—
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Burris, James D.; and Burris, Bobby V. Method and apparatus for harvesting cotton. 3,927,511, Cl. 56-33.000.

Burroughs Corporation: *See*—
Wojtowicz, Edward A.; Lazzarotti, S. James; and Tartar, Paul E., 3,927,876.

Butler Automatic, Inc.: *See*—
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Butler, Lee D.; and Wynn, Edward J., to Sperry Rand Corporation. Load position sensing and tier pattern selection for a bale wagon. 3,927,771, Cl. 214-6.00B.

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Byers, Thomas L. Graphics modifier. 3,927,942, Cl. 355-84.000.

Byram, Harold E.; Lockard, Ronald J.; Andersen, Roland D.; and Carney, Vincent L., to Andersen, Byram, Kouma, Murphy, Lockard & Carney. Voice-actuated telephone directory-assistance system. 3,928,724, Cl. 179-1.0SD.

Byrne, Francis P.; and Kaczmarek, Thomas D., to Westinghouse Electric Corporation. Technique for measuring the carbon monoxide and reactive hydrocarbon content of a gas. 3,927,979, Cl. 23-232.00R.

Calgon Corporation: *See*—
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Calmon, Calvin, to Water Purification Associates. Detection devices for use in solution processing systems. 3,928,200, Cl. 210-96.000.

Camiciottoli, Roberto: *See*—
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Campbell, John H., to General Electric Company. Fluorescent lamp having partitioned vapor discharge. 3,928,786, Cl. 313-493.000.

Campbell, William A., III, to Quality Food Machinery Inc. Article loading machine. 3,927,508, Cl. 53-251.000.

Camras, Marvin, to IIT Research Institute. Video transducing apparatus. 3,928,869, Cl. 360-55.000.

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Canadian Ingersoll-Rand Company Limited: *See*—
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Kusters, Norbert L.; and MacMartin, Malcolm P., 3,928,799.

Candor, James T. Frame construction for a plural page document. 3,927,483, Cl. 40-102.000.

Cannell Auto-Process Corporation: *See*—
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Cardarelli, Nathan F., to B.F. Goodrich Company, The. Biocidal elastomeric composition combinations and method for dispersing biocides therewith. 3,928,564, Cl. 424-83.000.
Carey, Milburn K. Automotive seat suspension system. 3,927,854, Cl. 248-372.000.
Carl Schenck AG, Firma: *See—*
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Carlos, Donald D.; and Hicks, Darrell D., to Celanese Coatings & Specialties Company. Aqueous thermoset coatings utilizing titanium chelate curing agents. 3,928,667, Cl. 427-385.000.
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Carson, Lawrence E., to Le Van Specialty Company, Inc. Quick release hinged vehicle window. 3,927,492, Cl. 49-141.000.
Carter, John L.; and McGowan, Joseph, to United States of America, Army. Power dividing and combining techniques for microwave amplifiers. 3,928,806, Cl. 325-128.000.
Carter, Richard S.; Hogan, Spurgeon G., Jr.; Leung, Wan L.; McGilvray, Bruce L.; and Werner, Robert H., to International Business Machines Corporation. Instruction fetch apparatus with combined look-ahead and look-behind capability. 3,928,857, Cl. 340-172.500.
Carter, Walter H.: *See—*
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Case, Derek Frank. Method of making multi track magnetic transducing heads. 3,927,470, Cl. 29-603.000.
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Cassella Farbwerke Mainkur AKT: *See—*
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Castanoli, Alder F. Multiple deck drying apparatus. 3,927,715, Cl. 165-120.000.
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Cenker, Moses; and Narayan, Thirumurti L., to BASF Wyandotte Corporation. Process for the preparation of carbodiimide-isocyanurate foams. 3,928,256, Cl. 260-2.5BF.
Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie: *See—*
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Cervelle, Claude Marie Henri. Treatment of hypoazotemic and atheromatous conditions using lespecapitoside and process for obtaining same. 3,928,585, Cl. 424-195.000.
Ceskoslovenska akademie ved: *See—*
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Chandra, Grish; and Rowland, Colin Mostyn, to Dow Corning Limited. Coating process. 3,928,629, Cl. 427-387.000.
Chandross, Edwin Arthur; and Kuck, Valerie Jeanne, to Bell Telephone Laboratories, Incorporated. Corrosion inhibitor. 3,928,683, Cl. 428-447.000.
Chang, Clarence Dayton; Silvestri, Anthony John; and Smith, Robert Lloyd, to Mobil Oil Corporation. Production of gasoline hydrocarbons. 3,928,483, Cl. 260-668.00R.
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Chang, Kenneth. Saw guide. 3,927,475, Cl. 33-42.000.
Chang, Yun-Feng; Cheung, Mo-Fung; and Dickie, Ray A., to Ford Motor Company. Method of making organic solvent free aqueous coating compositions of acrylic polymer latex, water soluble emulsion-polymerized acrylic polymer, and aminoplast. 3,928,273, Cl. 260-29.4UA.
Chapman, Rodney M.; and Temple, Kenneth A., to Du Pont de Nemours, E. I., and Company. Recirculating apparatus for continuous esterification reactions. 3,927,982, Cl. 23-260.000.
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Chenoweth, Amos J.; and Heafner, William E., to United States of America, Air Force. Thermal differential compensator. 3,928,822, Cl. 332-7.510.
Cherry, Kenneth Floyd. Bio pond aerator. 3,928,512, Cl. 261-91.000.
Cherry, Wesley E.; Dickason, Alan F.; and Hedge, John A., to Sun Ventures, Inc. Oxidation of butane to make anhydride and catalyst therefor. 3,928,392, Cl. 260-346.80A.
Cheslick, Walter A., Sr. Suppressant for coal dust. 3,928,222, Cl. 252-88.000.
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Child, Edward T.; and Robin, Allen M., to Texaco Inc. Methane-rich gas process. 3,927,997, Cl. 48-197.00R.

Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., to Texaco Inc. Production of methane-rich gas stream. 3,927,998, Cl. 48-197.00R.

Child, Edward T.; and Robin, Allen M., to Texaco Inc. Methane-rich gas process. 3,927,999, Cl. 48-197.00R.

Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., to Texaco Inc. Production of a clean methane-rich fuel gas from high-sulfur containing hydrocarbonaceous materials. 3,928,000, Cl. 48-197.00R.

Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., to Texaco Inc. Production of methane. 3,928,001, Cl. 48-197.00R.

Childers, Mark A.; and Dawkins, Enoch L., to Ocean Drilling & Exploration Company. Method of retrieving anchors. 3,927,636, Cl. 114-206.00R.

Chill, Leonard; Johnson, Gordon B.; and Weisner, Carl S., to Chevron Research Company. Apparatus for making yarn from polymer film. 3,927,957, Cl. 425-131.100.

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Chittenden, Richard Marion; and Wilson, Earl David, to Abbott Laboratories. Irrigation solution administration system and reservoir therefor. 3,927,671, Cl. 128-227.000.

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Chodzko, Richard A., to United States of America, Air Force. Multiple-selected-line unstable resonator. 3,928,817, Cl. 331-94.50C.

Cholvin, Robert L., to Garrett Corporation, The. Engine exhaust reactor air flow ratio control method and apparatus. 3,927,524, Cl. 60-289.000.

Chromalloy American Corporation: *See—*
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Chromalloy Pharmaceutical, Inc.: *See—*
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Chrosziel, Alfred S. Zoom lens control device. 3,927,932, Cl. 350-187.000.

Chugai Sciyaku Kabushiki Kaisha: *See—*
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Ciurca, Samuel John, Jr., to Eastman Kodak Company. Photographic elements containing iodoso or iodoxy oxidants. 3,928,043, Cl. 96-77.000.

Claeson, Karl Goran: *See—*
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Clapham, Thomas J. Magnetic propulsion system. 3,927,620, Cl. 104-148.0LM.

Clark, Gary T., to Eastman Kodak Company. Cationic dyes from 5-aminoimidazo-(1,2-A)-pyridines. 3,928,309, Cl. 260-146.00R.

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Clark, Robert John, to RCA Corporation. Character generator system selectively providing different dot-matrix size symbols. 3,928,845, Cl. 340-324.0AD.

Clausen, Kermit D.; and Rhodes, John R., to Columbia Scientific Industries, Inc. High speed pulse processing. 3,928,766, Cl. 250-273.000.

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Clement, Clarence C., Jr., to Halliburton Company. Methods and compositions for sealing subterranean earth formations. 3,928,052, Cl. 106-76.000.

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Cochrane, Ben A. Tamper-proof bottle cap and container. 3,927,784, Cl. 215-256.000.

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Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, to Institut Francais du Petrole, des Carburants & Lubrifiants. Enameling varnishes based on aromatic carboxylates reacted with polyisocyanates and polyols. 3,928,290, Cl. 260-75.0TN.

Cohen, Herbert I., to Acron Corporation. Repertory dialer. 3,928,731, Cl. 179-90.0BB.

Cohen, Melvin. Magazine rack. 3,927,768, Cl. 211-49.00D.

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Collins, John D.; Coates, Harold; and Siddiqui, Iftikhar Hussain, to Albright & Wilson Limited. Organotin compounds stabilizers for vinyl halide polymers. 3,928,284, Cl. 260-45.75S.

Collon, Paul: *See—*
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Colorado State University Research Foundation: *See—*
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Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, to Bell Telephone Laboratories, Incorporated. Common control variable shift reframe circuit. 3,928,726, Cl. 179-15.0BS.

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Compagnie Francaise des Petroles: *See—*
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Conroy, Edward Patrick, to Domtar Limited. Production of pitch substantially soluble in quinoline. 3,928,169, Cl. 208-22.000.

Consolidated Novelty Co., Inc.: *See—*
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Container Corporation of America: *See—*
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Controls Company of America: *See—*
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Cook, Albert W. Method of alleviating symptoms of multiple scleroisis. 3,928,594, Cl. 424-263.000.

Cook, John Hayward, to Xerox Corporation. Electrostatographic reproduction machines. 3,927,934, Cl. 355-3.00R.

Cook, John Ransom, to Chemical Fabrics Corporation. Process for coating a substrate with a fluorinated organic polymer and product thereof. 3,928,703, Cl. 428-255.000.

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Copal Company Limited: *See—*
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Coppock, Alden D. Adjustable weeding hoe. 3,927,721, Cl. 172-371.000.
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Corning Glass Works: *See—*
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Brandstrom, Arne Elof; Carlsson, Per Arvid Emil; Carlsson, Stig Ake Ingemar; Corrodi, Hans Rudolf; Ek, Lars; and Ablad, Bengt Arne-Hjalmar, 3,928,601.
Cosan Chemical Corporation: *See—*
Luloff, Jerome S.; and Eilender, Albert L., 3,928,607.
Costantini, Michel: *See—*
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Joufret, Michel, 3,928,452.
Coto-Coil Co., Inc.: *See—*
Abrams, Ralph, 3,928,829.
Coughlin, Robert W. Method of carrying out enzyme-catalyzed reactions. 3,928,143, Cl. 195-115.000.
Courtade, Michel Armand Christian; and Ferveur, Bernard Raymond Pierre, to British Petroleum Company Limited, The. Preservation of agricultural products. 3,928,620, Cl. 424-317.000.
Courtney, George W.: *See—*
Khayat, Ali; Courtney, George W.; and Dunn, Howard J., 3,928,637.
Couttet, Andre; Dubois, Jean Claude; and Zann, Annie, to Thomson-CSF. Nematic liquid crystal 4-methoxy-4'-hydroxytolan esters. 3,928,399, Cl. 260-410.500.
Covey, Rupert A.: *See—*
Hubbard, Winchester L.; Grahame, Robert E., Jr.; Covey, Rupert A.; and Jancis, Elmar H., 3,928,617.
Cowley, R. Adams: *See—*
Turney, Stephen Z.; Blumenfeld, Walter; Cowley, R. Adams; Wolf, Samuel; McCluggage, Charles; and Ashworth, John W., III, 3,927,670.
Cox, John Michael; and Burrell, Raymond Alexander, to Imperial Chemical Industries Limited. Certain quinoxaline N-oxides used to combat fungi. 3,928,608, Cl. 424-250.000.
Cox, Leonard C.; and Wyatt, Joe B. Apparatus for producing data indicative of the geometric shape and arrangement of the various components of a model. 3,927,948, Cl. 356-167.000.
CPC International Inc.: *See—*
Bohrmann, Hans; and Schneider, Gerhard, 3,928,650.
Freeman, Jere E.; Abdullah, Mukhtar; and Bocan, Byron J., 3,928,631.
Milkovich, Ralph; and Chiang, Mutong T., 3,928,255.
CPT Corporation: *See—*
Spence, Gary W., 3,928,847.
Cragoe, Edward J., Jr.; and Schultz, Everett M., to Merck & Co., Inc. Phenol compounds in treating pain, fever and inflammation. 3,928,624, Cl. 424-330.000.
Cramer, Deane G., to PPG Industries, Inc. Method and apparatus for forming glass on molten metal by using a radiation reflector. 3,928,010, Cl. 65-65.00A.
Cramer, John J.: *See—*
Ciko, John D.; and Cramer, John J., 3,927,970.
Crawford, James E.; and Gray, Don N., to Owens-Illinois, Inc. Biocompatible articles including polymeric membranes having high permeability to gases and uses thereof. 3,928,294, Cl. 260-79.30A.
Cremeans, George E.: *See—*
Scohy, John M.; Cremeans, George E.; and Luttinger, Manfred, 3,928,266.
Crenne, Noel: *See—*
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Joufret, Michel, 3,928,452.
Criddle, Ernest E.; and Neals, Pierrette L., to Canadian Patents and Development Limited. Diffuser drape. 3,927,667, Cl. 128-132.00D.
Crill, Marla S.: *See—*
Lauterbach, George E.; and Crill, Marla S., 3,928,707.
Crockwell, George Warren, to Union Carbide Corporation. Silicone rubber hose. 3,927,695, Cl. 138-137.000.
Cromeens, Jeff Y.; and Clyce, Thomas E., to Industrial Woodworking Machine Co., Inc. Methods and means for continuous vertical finger jointing lumber. 3,927,705, Cl. 144-317.000.
Crosby, Guy A., to Dynapol. Polymeric reagent. 3,928,293, Cl. 260-79.000.
Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., to Brunswick Corporation. Puck and bat for an air cushion table game. 3,927,885, Cl. 273-126.00R.
Crounse, Nathan N., to Sterling Drug Inc. 4,4'-Stilbenebispyridooxazoles and related optical brighteners and polymeric compositions brightened thereby. 3,928,228, Cl. 252-301.20W.
Crowell, Merton H., to North American Philips Corporation. Thermal imaging tube having a pyroelectric target and annular potential stabilizing electrode. 3,928,768, Cl. 250-333.000.
Cullen, William P.; Chafetz, Harry; and Hellmuth, Walter W., to Texaco Inc. Sulfurized and chlorinated alkylene polyamine reaction product lubricant additive and lubricating composition containing same. 3,928,381, Cl. 260-327.00C.
Cummins Engine Company, Inc.: *See—*
Perr, Julius P., 3,927,654.
Cunningham, Hugh: *See—*
Rahn, Henry W.; Cunningham, Hugh; Dilmore, Colonel R.; Jeffery, Thomas C.; and Raetzsch, Carl W., 3,928,150.
Cuntze, Ulrich: *See—*
Diery, Helmut; and Cuntze, Ulrich, 3,928,509.
Cuny, Francis: *See—*
Demars, Paul; Cuny, Francis; Garrigoux, Joseph; and Tassart, Christian, 3,928,745.
Curry, John Downing, to Procter & Gamble Company, The. Phenylantimony bis(2-pyridinethiol-1-oxide in antibacterial and antifungal compositions. 3,928,605, Cl. 424-245.000.
Curtin, Denis J., to A. B. Dick Company. Electrophotographic element which includes a photoconductive polyvinyl carbazole layer containing an aromatic anhydride. 3,928,035, Cl. 96-1.500.
Cutler, Royal A.: *See—*
Diana, Guy D.; and Cutler, Royal A., 3,928,427.
Czuba, Leonard J.: *See—*
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,928,391.
Daasvatn, Kari: *See—*
Dale, Johannes; Borgen, Gerd; and Daasvatn, Kari, 3,928,386.
Dachs, Karl; Faulhaber, Gerhard; Fikentscher, Rolf; Oppenlaender, Knut; and Schulze, Joachim, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Printing fibrous material. 3,928,688, Cl. 428-515.000.
Da Costa, Harry; and Foster, Victor W., to Motorola, Inc. Torque measuring means for miniature watch motors or the like. 3,927,559, Cl. 73-134.000.
Daguet, Jacques Lucien: *See—*
Bellanger, Maurice Georges; Lepagnol, Guy Pierre; and Daguet, Jacques Lucien, 3,928,755.
Dahl, Leif B. Hammer, knife and glue gun combination. 3,927,432, Cl. 7-8.10R.
Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, to Astra Lakemedel Aktiebolag. Certain polymer-iron complexes for treatment of iron deficiency. 3,928,581, Cl. 424-180.000.
Dahlbom, Johan Richard: *See—*
Barthold, Dag Vilhelm; Dahlbom, Johan Richard; Magnusson, Harry Olof; and Sjoberg, Berndt Olof Harald, 3,928,602.
Dahlen, Sven Erik; Ekstrom, Bertil Ake; and Sjoberg, Berndt Olof Harald, to Astra Lakemedel Aktiebolag. Dipenicillin and dicephalosporin ester antibiotics. 3,928,595, Cl. 424-271.000.
Dai-ichi Kogyo Seiyaku Co., Ltd.: *See—*
Goto, Sumio; and Ishihara, Kazuhiko, 3,928,212.
Yamauchi, Toshio, 3,928,062.
Dainichi-Nippon Cables, Ltd.: *See—*
Fuwa, Masaru; Takahashi, Kiyoshi; Otsuji, Masaaki; and Matsui, Masatake, 3,928,525.
Daiwa Steel Tube Industries Co., Ltd.: *See—*
Nakamura, Matsuichi, 3,927,816.
Dale, Johannes; Borgen, Gerd; and Daasvatn, Kari. Process for preparing cyclic polyethers. 3,928,386, Cl. 260-338.000.
Daley, William D.; Wilkalis, John E.; and Pieters, Wim J. M., to Allied Chemical Corporation. Process for the reduction of sulfur dioxide. 3,928,547, Cl. 423-564.000.
Dalton, William O., to Monsanto Company. Continuous process for the preparation of ABS type polyblends. 3,928,495, Cl. 260-876.00R.
Dammar, Raymon H., to Possis Corporation. Coil winding machine with improved wire gripping and cutting means. 3,927,456, Cl. 29-205.00C.
Dammar, Raymon H., to Possis Corporation. Method of winding armatures. 3,927,469, Cl. 29-597.000.
Dammar, Raymon H., to Possis Corporation. Armature winding machine with improved lead retaining means. 3,927,843, Cl. 242-7.05B.
Danneberg, Peter: *See—*
Renth, Ernst Otto; Schromm, Kurt; Mentrup, Anton; and Danneberg, Peter, 3,928,358.
Danon, Michael, to Leisure Moments Incorporated. Bicycle support rack. 3,927,810, Cl. 224-29.00R.
Dart Industries Inc.: *See—*
Minsky, Norman C.; and Hiatt, Russell D., 3,927,610.
Darwin, Frank S. Bobbin monitor for sewing machines. 3,928,752, Cl. 235-92.0PD.
Dassel, Mark W., to Du Pont de Nemours, E. I., and Company. Azeotropic nitration of benzene. 3,928,475, Cl. 260-645.000.
Daum, Hermann: *See—*
Stefan, Johann; and Daum, Hermann, 3,927,680.
Davey, John R., to Armstrong Cork Company. Manufacturing ceiling tile. 3,927,706, Cl. 144-326.00R.
Davis, Francis E., Jr.; Graven, Richard G.; Lee, Wooyoung; and Sailor, Robert A., to Mobil Oil Corporation. Catalytic cracking of FCC gasoline and virgin naphtha. 3,928,172, Cl. 208-77.000.
Davis, Glenn T. Pressurized underground cable pedestal. 3,928,713, Cl. 174-38.000.

Davis, Robert E. Method of catalyst preparation for use in suppressing hydrocarbon and carbon monoxide emission from internal combustion engines. 3,928,237, Cl. 252-465.000.

Dawkins, Enoch L.: *See—*
Childers, Mark A.; and Dawkins, Enoch L., 3,927,636.

Day, Omar. Board game. 3,927,886, Cl. 273-135.00R.

Day, Robert H., to Illinois Tool Works Inc. Cups for holding ingredients for drinks. 3,927,766, Cl. 206-519.000.

Dayco Corporation: *See—*
Haren, Doyle V.; and Logan, Arthur D., 3,928,521.
Holden, Homer N., 3,928,715.

Dean, Richard H.: *See—*
Appleton, Thomas R.; Dean, Richard H.; Hillman, Edward J.; Nelson, Charles J.; and Sinn, Gunter E., 3,928,672.

Dearlove, William E., to Caterpillar Tractor Co. Loading apparatus for a collection vehicle. 3,927,780, Cl. 214-519.000.

de Baan, Johannes J., to August Bilstein, Firma. Cover plate for cylinders having sealed piston rod guides. 3,927,871, Cl. 267-65.00R.

Debarge, Albert: *See—*
Delarue, Jean-Louis; and Debarge, Albert, 3,928,341.

DeColibus, Raymond Lew, to Du Pont de Nemours, E. I., and Company. TiO_2 Pigment coated with porous alumina/silica and dense silica. 3,928,057, Cl. 106-300.000.

DeCoulos, John, to Boston Machine Works Company. Welt application process for unit soles and wedge platforms. 3,927,433, Cl. 12-142.00D.

de Figueiredo, Antonio M. C., to Raymond Lee Organization, Inc., The, a part interest. Thermomolecular rectifier. 3,927,532, Cl. 60-721.000.

Defraye, Rene Charles: *See—*
Philippe, Leon Jean; Defraye, Rene Charles; and Renard, Lucien Paul, 3,927,558.

Degremont, Societe Generale d'Epuration et d'Assainissement: *See—*
Bebin, Jean Louis, 3,928,190.

De Haes, Louis Maria; and Volz, Hans-Georg, to Agfa-Gevaert N.V. Titanium dioxide with aluminum oxide or aluminium oxide plus silicon dioxide precipitated thereon as pigment for diffusion transfer. 3,928,037, Cl. 96-29.00R.

de Hass, Franciscus Cupertinus Maria: *See—*
van Esdonk, Johannes; Hornman, Johannes Petrus; and de Hass, Franciscus Cupertinus Maria, 3,928,782.

de Hedouville, Philippe, to U.S. Philips Corporation. Laundry washing and drying machine. 3,927,542, Cl. 68-17.00R.

de Keyzer, Cornelis Jacobus, to Rank Xerox Ltd. Cleaning assembly for an electrostatographic device. 3,927,937, Cl. 355-15.000.

Delaney, R. Edward; and Cornish, Alan H., to Koehler-Dayton, Inc. Sewerage treatment system. 3,927,425, Cl. 4-10.000.

Delarue, Jean-Louis; and Debarge, Albert, to Merrell Toraude. N-Aminoalkyl-4-anilino pyridines. 3,928,341, Cl. 260-247.50G.

Dellorfano, Fred M., Jr.: *See—*
Massa, Frank, 3,928,777.

DeMan, Heiko T. Liquid dispenser with multi-container reserves. 3,927,804, Cl. 222-136.000.

De Marinis, Robert M.; and Hoover, John R. E., to SmithKline Corporation. Substituted sulfonylacetamido cephalosporins. 3,928,338, Cl. 260-243.00C.

Demars, Paul; Cuny, Francis; Garrigoux, Joseph; and Tassart, Christian, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of electric welding by transferred plasma and a welding torch for carrying said method into effect. 3,928,745, Cl. 219-121.00P.

Demmering, Gunther: *See—*
Linden, Heinz; Gartner, Jurgen; Offermann, Wilhelm; and Demmering, Gunther, 3,928,276.

Demole, Edouard: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,928,456.

Denzel, Theodor; and Hoehn, Hans, to E. R. Squibb & Sons, Inc. Derivatives of pyrazolo[3,4-b]thieno[2,3-d]pyridine-2-carboxylic acids. 3,928,362, Cl. 260-294.80B.

Denzel, Theodor: *See—*
Hoehn, Hans; and Denzel, Theodor, 3,928,368.

Depoix, Pierre: *See—*
Gerbier, Gerard; and Depoix, Pierre, 3,928,072.

Depree, David O.: *See—*
Katzakian, Arthur, Jr.; and Depree, David O., 3,928,192.

Derbyshire, Philip Edward: *See—*
Saunders, Peter Anthony; Fox, Michael Frank; Fagan, Anthony Francis; and Derbyshire, Philip Edward, 3,928,216.

Derrien, Michel: *See—*
Torck, Bernard; Franck, Jean-Pierre; and Derrien, Michel, 3,928,488.

Descamps, Marcel; and Van Durme, Etienne, to Labaz. Benzo[b]thienyl acetic acid esters. 3,928,384, Cl. 260-330.500.

Deschamps, Andre; Renault, Philippe; and Dezael, Claude, to Institut Francais du Petrole, des Carburants et Lubrifiants. Process for purifying a sulfurous anhydride containing gas and producing elemental sulfur. 3,928,548, Cl. 423-575.000.

Detoia, Vincent D., to Raymond Lee Organization, Inc., The, a part interest. Ski and snow shoe device. 3,927,896, Cl. 280-11.13C.

Deura, Hiroshi: *See—*
Sato, Tsutomu; Deura, Hiroshi; and Oba, Kenkichi, 3,928,268.

Deutsche Gold-und Silber-Scheideanstalt vormals Roessler: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 3,928,238.
Koberstein, Edgar; and Lakatos, Eduard, 3,928,534.
Westlinning, Hermann; Schwarze, Werner; and Fleischhauer, Horst, 3,928,344.

Devik, Ole Gabriel: *See—*
Tangsrud, Nils; and Devik, Ole Gabriel, 3,928,639.

Dezael, Claude: *See—*
Deschamps, Andre; Renault, Philippe; and Dezael, Claude, 3,928,548.

Dhaliwal, Pritam Singh, to Du Pont de Nemours, E. I., and Company. Schiff base and metal bisazomethine metal chelate. 3,928,328, Cl. 260-240.00G.

Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, to Bayer Aktiengesellschaft. Lacquer systems which are harmless to the environment. 3,928,265, Cl. 260-21.000.

Diamond Shamrock Corporation: *See—*
O'Leary, Kevin J.; Tomba, Charles P.; and Fenn, Robert W., III, 3,928,166.

Diana, Guy D.; and Cutler, Royal A., to Sterling Drug Inc. N,N'-bridged-bis[2-alkyl-2-hydroxyethylamine]salts. 3,928,427, Cl. 260-501.170.

Dickason, Alan F.: *See—*
Cherry, Wesley E.; Dickason, Alan F.; and Hedge, John A., 3,928,392.

Dickey-john Corporation: *See—*
Fathauer, George H., 3,928,751.

Dickie, Ray A.: *See—*
Chang, Yun-Feng; Cheung, Mo-Fung; and Dickie, Ray A., 3,928,273.

Diem, Hans; Matthias, Guenther; Aicher, Albrecht; Haas, Hans; Schreiber, Hans; and Sperber, Heinrich, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Production of formaldehyde. 3,928,461, Cl. 260-603.0HF.

Diem, Hans: *See—*
Aicher, Albrecht; Diem, Hans; Haas, Hans; Hess, Klaus; Hussy, Oskar; Matthias, Guenther; Sperber, Heinrich; and Stickel, Richard, 3,928,460.

Diery, Helmut; and Cuntze, Ulrich, to Hoechst Aktiengesellschaft. Hybrid ionic phosphorus compounds. 3,928,509, Cl. 260-945.000.

Digoy, Jean Louis, to U.S. Philips Corporation. Semiconductor radiation detector and method of manufacturing same. 3,928,866, Cl. 357-30.000.

Dijkmans, Eise Carel: *See—*
Aagaard, Einar Andreas; Coenders, Johannes Wilhelmus; and Dijkmans, Eise Carel, 3,928,730.

Dillon, William; and Blachowski, John A., to Skil Corporation. Collet assembly for a reciprocating tool. 3,927,893, Cl. 279-75.000.

Dilmore, Colonel R.: *See—*
Rahn, Henry W.; Cunningham, Hugh; Dilmore, Colonel R.; Jeffery, Thomas C.; and Raetzsch, Carl W., 3,928,150.

Di Matteo, Paul L.: *See—*
Pollack, Philip; and Di Matteo, Paul L., 3,928,850.

Dimeler, Glenn R.: *See—*
Mills, Ivor W.; and Dimeler, Glenn R., 3,928,168.

Di Mola, Nunzio: *See—*
Winters, Giorgio; and Di Mola, Nunzio, 3,928,371.

Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung: *See—*
Lang, Franz Josef, 3,927,625.

Dobbratz, Edward J., to Dobbratz, Janet E., a part interest. Slide assembly. 3,927,918, Cl. 308-3.600.

Dobbratz, Janet E.: *See—*
Dobbratz, Edward J., 3,927,918.

Dockner, Toni; and Platz, Rolf, to BASF Aktiengesellschaft. Manufacture of carboxamides. 3,928,439, Cl. 260-557.00R.

Dr.-Ing. Max Schloetter: *See—*
Steeg, Joachim, 3,928,149.

Dohgane, Iwao: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Fujino, Hidekazu; Tanimoto, Kenji; Hosaka, Hirokazu; Ehara, Kazunari; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; and Yasuda, Minoru, 3,928,469.

Doi, Tetsuo: *See—*
Sagae, Syoji; and Doi, Tetsuo, 3,928,718.

Dolhyj, Serge R.: *See—*
Milberger, Ernest C.; and Dolhyj, Serge R., 3,928,240.

Dolly Toy Company, The: *See—*
Marcus, Kenneth N., 3,927,482.

Domtar Limited: *See—*
Conroy, Edward Patrick, 3,928,169.

Donald, Dennis Scott, to Du Pont de Nemours, E. I., and Company. Multifunctional pyrazines. 3,928,351, Cl. 260-250.0BN.

Donovan, Timothy F.; and Ryan, William P., to Mite Corporation. Solenoid system for moving a type member. 3,927,753, Cl. 197-49.000.

Dooner Laboratories, Inc.: *See—*
Behrakis, George D., 3,928,609.

Dorland, Lee A. Apparatus for providing patterns on television receiver screens. 3,928,717, Cl. 178-6.000.

Dorn, Gordon L., to J. K. & Susie L. Wadley Research Institute & Blood Bank. Detection of microbial pathogens. 3,928,139, Cl. 195-103.50R.

Dorn, Michael Thomas: *See—*
Jones, Herbert; and Dorn, Michael Thomas, 3,927,448.

Dornheim, Gotz Gotmar: *See—*
Wandel, Martin; Salamon, Manfred; Dornheim, Gotz Gotmar; and Kuhlmann, Bernard, 3,928,696.

Dorst, Richard: *See—*
Reime, Roy O., 3,927,728.
Douros, John D., Jr.; and Kerst, Al F., to Gates Rubber Company, The. Violuric acid as an algaecide. 3,928,017, Cl. 71-67.000.
Dow Chemical Company, The: *See—*
Beale, Alvin F., Jr.; and Lee, John M., 3,928,438.
Moyle, Clarence L.; and Wolf, Paul A., 3,928,575.
Philp, Dennis H.; and Madison, Norman L., 3,928,695.
Tomalia, Donald A.; and Thill, Bruce P., 3,928,499.
Walker, Eddie Bob, 3,928,288.
Wang, Chun Shan; and Mintz, Michael J., 3,928,370.
Dow Corning Limited: *See—*
Chandra, Grish; and Rowland, Colin Mostyn, 3,928,629.
Dowell, Arthur M., Jr.; and Reitemeier, Arthur L., to Tee-Pak, Inc. Collagen slurry containing partial fatty acid esters of glycerin. 3,928,653, Cl. 426-657.000.
Dowell, Arthur M., Jr.: *See—*
Froehlich, Leonhard H.; and Dowell, Arthur M., Jr., 3,928,651.
Downs, Dallas I.: *See—*
Larson, Lory E.; and Downs, Dallas I., 3,927,534.
Doyel, John S. Beverage making device. 3,927,608, Cl. 99-297.000.
Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, to Bayer Aktiengesellschaft. N-methyl-imidazole derivatives and their production. 3,928,348, Cl. 260-250.00A.
Drage, James John, to Sumlock Anita Electronics Limited. Keyboard switch assembly having discrete helical conductors providing wiping action. 3,928,736, Cl. 200-5.00A.
Dreher, Karl D.; and Gogarty, William B., to Marathon Oil Company. High fluidity cutting oils which exhibit retro-viscous properties. 3,928,215, Cl. 252-33.300.
Drelich, Arthur H.; and Lukacs, George J., to Johnson & Johnson. Synthetic resin compositions and methods applying the same to porous materials to control migration thereon. 3,928,676, Cl. 427-341.000.
Dresser Industries, Inc.: *See—*
Zinsmeyer, Herbert G.; Johnson, Rodney L.; Genz, Ralph H.; and Setliff, James E., 3,927,800.
Droll, Hans. Wire supply control arrangement. 3,927,842, Cl. 242-1.10R.
Dubois, Jean Claude: *See—*
Couttet, Andre; Dubois, Jean Claude; and Zann, Annie, 3,928,399.
Dumont, Fritz, to Baugesellschaft Klammt KG. Apparatus for driving sheet piles into the ground. 3,927,861, Cl. 254-29.00R.
Dungey, Harold J.; and Frendberg, Arthur M., to Babcock & Wilcox Company. Vapor generator. 3,927,646, Cl. 122-6.00A.
Dunigan, Francis P. Photoelectric apparatus employing phase locked loop circuits. 3,928,761, Cl. 250-205.000.
Dunn, Howard J.: *See—*
Khayat, Ali; Courtney, George W.; and Dunn, Howard J., 3,928,637.
Dunning, Robert M., to Hoerner Waldorf Corporation. Lined carton. 3,927,821, Cl. 229-14.0BL.
Du Pont de Nemours, E. I., and Company: *See—*
Alaburda, Raymond Daniel, 3,928,681.
Baird, Richard Leroy, 3,928,111.
Belasco, Irvin Joseph, 3,928,191.
Briggs, Anglis R.; and Maxwell, Thomas J., 3,928,566.
Chapman, Rodney M.; and Temple, Kenneth A., 3,927,982.
Dassel, Mark W., 3,928,475.
DeColibus, Raymond Lew, 3,928,057.
Dhaliwal, Pritam Singh, 3,928,328.
Donald, Dennis Scott, 3,928,351.
Fang, James C., 3,928,420.
Fang, James C., 3,928,424.
Fang, James C., 3,928,492.
Gregory, Donald Dale; and Wendel, Martin Maurice, 3,928,543.
Johnson, Thomas Albert, 3,928,478.
Leverett, Glenn Frederick, 3,928,524.
Nottke, James E., 3,928,350.
Tarney, Robert Edward; and Verbanc, John Joseph, 3,928,664.
Dupree, Donald G.; Bailey, Raymond E.; and Ling, Chester H. K., to Xerox Corporation. Method of making a cylindrically shaped, hollow electroforming mandrel. 3,927,463, Cl. 29-447.000.
Durand, Francois. Gear reduction device with floating pinion. 3,927,575, Cl. 74-410.000.
Durif-Varambon, Bruno: *See—*
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,928,290.
Duro-Test Corporation: *See—*
Koo, Ronald C., 3,927,989.
Dursch, Friedrich; and Siewarga, Theodore Michael, to E. R. Squibb & Sons, Inc. 7-(D-α-amino-1,4-cyclohexadien-1-ylacetamido)desacetoxycephalosporanic acid dihydrate compositions. 3,928,591, Cl. 424-246.000.
Duwel, Dieter; Kirsch, Reinhard; Loewe, Heinz; and Urbanietz, Josef, to Hoechst Aktiengesellschaft. Anthelmintically active 2-carbalkoxy-amino-benzimidazolyl-5(6)-amino-phenyl ethers. 3,928,375, Cl. 260-309.200.
Dycke, Norbert; and Sakai, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Ejecting device for use in metal forging machine. 3,927,549, Cl. 72-345.000.
Dyckerhoff Zementwerke A.G.: *See—*
Schmitt-Henco, Carl Heinrich; and Rauschenfels, Eberhard, 3,928,058.
Dyna-Therm Corporation, The: *See—*
Peterson, Roger L., 3,928,210.
Dynamit Nobel AG: *See—*
El-Chahawi, Moustafa; and Richtzenhain, Hermann, 3,928,429.
Dynamit Nobel Aktiengesellschaft: *See—*
Brachert, Heinrich; Girke, Dieter; and Kleiss, Joachim, 3,928,514.
Buning, Robert; Loebler, Peter; and Trautvetter, Werner, 3,928,684.
Heuschen, Alexander; Schaefer, Hans; Budich, Wolfgang; Krah, Robert; and Obermeier, Karl, 3,928,100.
Dynapol: *See—*
Crosby, Guy A., 3,928,293.
Dzus Fastener Co., Inc.: *See—*
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E. D. Bullard Company: *See—*
Raschke, Herbert A., 3,927,668.
E. R. Squibb & Sons, Inc.: *See—*
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Hoehn, Hans; and Denzel, Theodor, 3,928,368.
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Eastman Kodak Company: *See—*
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Audran, Roger G. L.; and Pinguad, Bernard J., 3,928,709.
Ciurca, Samuel John, Jr., 3,928,043.
Clark, Gary T., 3,928,309.
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Jackson, Brian W., 3,928,678.
Jackson, Brian W.; Winkler, Dean E.; and Woodworth, Charles B., 3,928,679.
Roman, Robert J., 3,927,847.
Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, to Sandoz Ltd. 1,3,4,9b-Tetrahydro-2H-indeno[1,2-c]pyridines. 3,928,360, Cl. 260-293.540.
Eder, Theodor, to Waagner-Biro Aktiengesellschaft; and Chemie und Metall GmbH Rheax. Method and apparatus for classifying viscous slurries. 3,928,182, Cl. 209-12.000.
Edlund, Herman Allan Friedrich. Device for calculating the resonant rolling period of a ship. 3,928,754, Cl. 235-150.200.
Edwards, Bryant, to Illinois Tool Works Inc. Plastic container and base construction. 3,927,782, Cl. 215-100.00R.
Edwards, Roger Joseph; Hairabedian, Barouyr Zareh; and Poley, Neil Myron, to International Business Machines Corporation. Gaseous discharge display panel including pilot electrodes and radioactive wire. 3,928,781, Cl. 313-54.000.
Edwin Cooper & Company: *See—*
Saunders, Peter Anthony; Fox, Michael Frank; Fagan, Anthony Francis; and Derbyshire, Philip Edward, 3,928,216.
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Eiland, Ehrlich M., to Aluminum Company of America. Opaque white coating composition comprising essentially cellulose ester/cross-linking agent/catalyst/solvent and organic liquid. 3,928,260, Cl. 260-14.000.
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Elam, Richard C.: *See—*
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El-Chahawi, Moustafa; and Richtzenhain, Hermann, to Dynamit Nobel AG. Method of preparing aryl acetic acids. 3,928,429, Cl. 260-515.00R.
Electric Fuel Propulsion Incorporated: *See—*
Aronson, Robert R., 3,928,080.
Elektriska Svetsningsaktiebolaget: *See—*
Ericsson, Rolf, 3,928,746.

Elektro-Mekanik: *See—*
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Elias, Jack, to Honeywell Inc. Switch interlock circuit. 3,928,789, Cl. 317-136.000.
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Emery Industries, Inc.: *See—*
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Emkjer, Erwin J.; and Tucker, I. Kenneth, to Kenematic Company Inc. Method and apparatus for opening letter envelopes. 3,927,589, Cl. 83-23.000.
Endersen, William Christian, to F. L. Smidth & Co. Rotary kiln. 3,927,960, Cl. 432-80.000.
Endo Laboratories: *See—*
Rajagapalan, Parthasarathi; and Pachter, Irwin J., 3,928,611.
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Engdahl, Holger Gustaf; and Parviainen, Raimo Johannes, to Enso-Gutzeit Osakeyhtio. Laminated settler. 3,928,209, Cl. 210-519.000.
Engel, Walter, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Sabot projectile. 3,927,618, Cl. 102-93.000.
Engel, William Karl, to Caterpillar Tractor Co. Mechanical multiplier-design II. 3,927,527, Cl. 60-427.000.
Engel, Wolfhard: *See—*
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Engelhard, Gunther: *See—*
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Erdman, Frank H., to Tropicana Products, Inc. Container and cap with depressible section for drinking access. 3,927,794, Cl. 220-268.000.
Erickson, Lars, to Walter Kidde & Co., Inc. Retractor mechanism for latch bolt. 3,927,905, Cl. 292-169.220.
Erickson, Wallace A.; and Suh, Byoung, to Wallace A. Erickson & Company. Preparation of dental restorative filling materials. 3,928,280, Cl. 260-42.280.
Ericsson, Rolf, to Elektriska Svetsningsaktiebolaget. Direct current power supply for manual arc welding. 3,928,746, Cl. 219-135.000.
Eriksson, Carl-Erik, to AB Bofors. Device for loading an artillery piece. 3,927,598, Cl. 89-45.000.
Ernst, Werner, to Inventio Aktiengesellschaft. Load dependent acting brake for conveyor devices. 3,927,738, Cl. 188-187.000.
Eschenmoser, Albert: *See—*
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Esper, Friedrich J.; Friese, Karl-Hermann; and Pollner, Rudolf, to Robert Bosch G.m.b.H. Ceramic oxide resistor element. 3,928,837, Cl. 338-22.00R.
Essery, John Michael, to Bristol-Myers Company. Process for the production of cefamandole. 3,928,334, Cl. 260-243.00C.
Essery, John Michael; and Cheney, Lee Cannon, to Bristol-Myers Company. 7-[D-(α-aminoα-phenyl-, 2-thienyl- and 3-thienyl-acetamido)]-3-(3-methyl-1,2,5-oxadiazol-4-yl)carbonylthiomethyl-3-cephem-4-carboxylic acids. 3,928,336, Cl. 260-243.00C.
Essery, John Michael, to Bristol-Myers Company. Process for the production of cefamandole. 3,928,337, Cl. 260-243.00C.
Ethyl Corporation: *See—*
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Kerley, Robert V., 3,927,992.
Ettel, Victor A.: *See—*
Gendron, Aubrey S.; Tilak, Bommaraju V.K.S.R.A.; and Ettel, Victor A., 3,928,153.
Etter, Berwyn E. Tip for an industrial gas cutting torch and method of using same. 3,928,084, Cl. 148-9.000.
Evans, Wayne Wheeler, to RCA Corporation. Analog voltage generators for television tuners. 3,928,808, Cl. 325-464.000.
Eversberg, Hans: *See—*
Schonfeld, Wolfram; Philipps, Armin; Eversberg, Hans; Hausler, Karl-Heinz; and Samans, Robert, 3,927,547.
Exotech, Incorporated: *See—*
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Exxon Research and Engineering Company: *See—*
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King, William H., Jr.; and Varga, Gideon M., Jr., 3,928,063.
Knudsen, Christian W.; and von Rosenberg, Hermann E., 3,927,996.
Mueller, David E.; and Segura, Marnell A., 3,928,024.
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 3,928,297.
Wohnhaas, George J.; Ungar, Israel S.; and Scher, Herbert I., 3,928,527.
Wright, Donald L.; and Frankenfeld, John W., 3,928,557.
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Endersen, William Christian, 3,927,960.
Fabris, Hubert J.; and Phillips, Wendell O., to General Tire & Rubber Company, The. Processable non-burning ABS-PVC blends. 3,928,502, Cl. 260-891.000.
Fagan, Anthony Francis: *See—*
Saunders, Peter Anthony; Fox, Michael Frank; Fagan, Anthony Francis; and Derbyshire, Philip Edward, 3,928,216.
Fagel, Roger, to Ateliers de Constructions Electriques de Charleroi (ACEC). Resiliently laterally shiftable axle mounting bogie. 3,927,910, Cl. 295-36.00R.
Faiks, Frederick S., to Steelcase, Inc. Movement device. 3,927,920, Cl. 308-36.000.
Fairchild Camera and Instrument Corporation: *See—*
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Anthony, Michael P.; Gunsagar, Kamleshwar; Kim, Choong-Ki; and Walsh, Lloyd R., 3,927,468.
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Falke, Erich, to Knorr-Bremse GmbH. Operator's brake valve for a railway vehicle air braking system. 3,927,917, Cl. 303-68.000.
Fang, James C., to Du Pont de Nemours, E. I., and Company. Mixed esters of polybasic saturated acids, glycols and glycidyl esters. 3,928,420, Cl. 260-475.00P.
Fang, James C., to Du Pont de Nemours, E. I., and Company. Mixed esters of dibasic unsaturated acids, glycols and glycidyl esters. 3,928,424, Cl. 260-485.00G.
Fang, James C., to Du Pont de Nemours, E. I., and Company. Coating compositions containing mixed esters of dibasic unsaturated acids, glycols and glycidyl tertiary esters, polyesters and amine-aldehyde resins. 3,928,492, Cl. 260-850.000.
Farbenfabriken Bayer Aktiengesellschaft: *See—*
Werle, Eugen; Fritz, Hans; and Schult, Harald, 3,928,305.
Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Oxidative dehydrogenation of alkenes or alkadienes to furan compounds. 3,928,389, Cl. 260-346.10R.
Farmland Industries, Inc.: *See—*
Romans, Duane R., 3,927,994.
Romans, Duane R., 3,927,995.
Farnsworth, Robert S. Process and apparatus for growing plants. 3,927,491, Cl. 47-1.200.
Farr, Emory W., to Transducers, Inc. Moment desensitization of load cells. 3,927,560, Cl. 73-141.00A.
Farrell, John J., to Farrell Patent Company. Method of making a blow molded container with hollow handle. 3,928,522, Cl. 264-89.000.
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Fathauer, George H., to Dickey-john Corporation. Seed population monitor. 3,928,751, Cl. 235-92.0PK.
Fatkulina, Rozalia Komalovna: *See—*
Berlin, Alfred Anisimovich; Aseeva, Roza Mikhailovna; Mezhikovsky, Semen Markovich; Sherle, Alla Ilinichna; Tsepalova, Nadezhda Alexeevna; Goldovsky, Evgeny Alexandrovich; Zelenetskaya, Tatiana Vladimirovna; Fatkulina, Rozalia Komalovna; and Kuzminsky, Alexandr Samoilovich, 3,928,489.
Faulhaber, Gerhard: *See—*
Dachs, Karl; Faulhaber, Gerhard; Fikentscher, Rolf; Oppenlaender, Knut; and Schulze, Joachim, 3,928,688.

Fauth, Frederick E., to American Bottlers Equipment Company. Automatic control system for a motor-driven conveyor section. 3,927,757, Cl. 198-37.000.

Fawcett, Derek James, to Lewmar Marine Limited. Disengaging clutch systems for a three-speed winch. 3,927,580, Cl. 74-812.000.

Feichtner, John D., to Westinghouse Electric Corporation. Collinear acousto-optical tunable filter and acousto-optically tunable laser. 3,928,814, Cl. 331-94.50M.

Fekete, Eugene Zoltan, to Huyck Corporation. Papermakers felts. 3,928,699, Cl. 428-212.000.

Feldkamper, Richard: *See—*
Brockmuller, Friedrich Franz; Schwarzkopf, August; and Feldkamper, Richard, 3,927,606.

Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung: *See—*
Poeschl, Rudolf, 3,928,125.

Fella-Werke G.m.b.H.: *See—*
Stefan, Johann; and Daum, Hermann, 3,927,680.

Feniak, George, to Polysar Limited. Halogenated butyl rubber of improved scorch characteristics. 3,928,259, Cl. 260-5.000.

Fenichel, Richard L.: *See—*
Wolf, Milton; Sellstedt, John H.; and Fenichel, Richard L., 3,928,590.

Fenn, Robert W., III: *See—*
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Fenner, Hans-Ueli: *See—*
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Ferguson, Laureen M., to Raymond Lee Organization, Inc., The, a part interest. Guitar finger shield. 3,927,595, Cl. 84-322.000.

Ferrario, Renzo: *See—*
Papa, Sisto; Moiso, Ugo; and Ferrario, Renzo, 3,927,963.
Papa, Sisto Sergio; and Ferrario, Renzo, 3,928,313.

Ferrigno, Thomas Howard. Hydrous magnesium containing silicate minerals with reduced absorbencies. 3,928,059, Cl. 106-306.000.

Ferro Corporation: *See—*
Snow, Jerry D., 3,928,668.

Fertin, Jacques, to U.S. Philips Corporation. Linear display device. 3,928,864, Cl. 357-17.000.

Ferveur, Bernard Raymond Pierre: *See—*
Courtade, Michel Armand Christian; and Ferveur, Bernard Raymond Pierre, 3,928,620.

Fiat Societa per Azioni: *See—*
Vannini, Paolo; Anselmino, Luigi; and Frazzini, Giuseppe, 3,928,780.

Fiberglas Canada Limited: *See—*
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Fichtel & Sachs A.G.: *See—*
Bergles, Eduard, 3,927,736.
Bergles, Eduard, 3,927,904.

Field, Peter Graham Spencer; and Lock, David Anthony, to Burmah Oil Trading Limited. Production of phenols from decomposition of aromatic hydroperoxides. 3,928,477, Cl. 260-621.00C.

Fikentscher, Rolf: *See—*
Dachs, Karl; Faulhaber, Gerhard; Fikentscher, Rolf; Oppenlaender, Knut; and Schulze, Joachim, 3,928,688.

Fineman, J. C.: *See—*
Jones, Roger W.; Fineman, J. C.; and Roesser, James R., 3,927,752.

Fink, Werner; and Kircher, Dieter, to ITT Industries, Inc. Hydraulic anti-skid control arrangement including a plurality of throttles for synchronous and asynchronous control of the wheels of one axle of a vehicle. 3,927,914, Cl. 303-21.00F.

Finmekano Erik Samuelsson AB: *See—*
Samuelsson, Mokjas Erik Samuel, 3,927,550.

Finnen, Gerald W.; and Wilson, Herman Q., to Westinghouse Electric Corporation. Tamper proof watthour meter enclosure. 3,928,788, Cl. 317-111.000.

Firestone Tire & Rubber Company, The: *See—*
Hergenrother, William L., 3,928,490.
Lohr, Delmar F., Jr.; and Kang, Jung W., 3,928,282.
Sanda, Joseph C., Jr., 3,928,291.

Firewood, Inc.: *See—*
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Firmenich S.A.: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,928,456.
Naf, Ferdinand, 3,928,402.
Stadler, Paul A.; Eschenmoser, Albert; and Sundt, Erling, 3,928,246.

Firtion, Victor Andrew: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,927,939.

Fischer & Porter Co.: *See—*
Ketelsen, Broder, 3,927,564.
Narita, Mikio; Ohashi, Kiyoto; and Yamamoto, Jun, 3,928,810.

Fisher Gauge Limited: *See—*
Fisher, William Frederick; and Hodgson, Timothy Brian, 3,927,711.

Fisher, John G.; and Straley, James M., to Eastman Kodak Company. Novel quaternized heterocyclic monoazo dyes. 3,928,311, Cl. 260-156.000.

Fisher, Michael H.: *See—*
Bochis, Richard J.; and Fisher, Michael H., 3,928,372.

Fisher, William Frederick; and Hodgson, Timothy Brian, to Fisher Gauge Limited. High pressure die casting apparatus. 3,927,711, Cl. 164-303.000.

Fishman, Herbert; and Kresge, James S., to General Electric Company. Metal oxide voltage-variable resistor composition. 3,928,245, Cl. 252-521.000.

Fisk, Harry R.; and Clark, Jeffrey J., to Garrett Corporation, The. Braze alloy system. 3,928,029, Cl. 75-159.000.

Fisons Ltd.: *See—*
Jablonski, John Michael; and Miller, John, 3,928,410.

Flachglas Aktiengesellschaft Delog-Detag: *See—*
Lang, Joseph; Meckenstock, Helmut; and Nopper, Hans-Joachim, 3,927,819.

Fleck, Fritz; Schmid, Horst; Mercer, Alec Victor; and Paver, Roger, to Sandoz Ltd. Bis-v-triazolyl-stilbenes. 3,928,329, Cl. 260-240.100.

Fleckenstein, Lee J., to Eastman Kodak Company. Novel p-sulfonamidophenols capable of releasing a heterocyclic azo dye. 3,928,312, Cl. 260-156.000.

Fleischhauer, Horst: *See—*
Westlinning, Hermann; Schwarze, Werner; and Fleischhauer, Horst, 3,928,344.

Flider, Frank S., to Justrite Manufacturing Company. Plastic jerry can. 3,927,797, Cl. 220-318.000.

Flight Connector Corporation: *See—*
Iacobucci, Cesidio R., 3,927,841.

Flosser, Walter, to Oehler-Wyhlen-Lagertechnik A.G. Warehouse with high shelves. 3,927,495, Cl. 52-36.000.

Fluid Energy Processing & Equipment Co.: *See—*
Stephanoff, Nicholas N., 3,927,479.

Flymo Societe Anonyme: *See—*
Arnblock, Lennart Oswald, 3,927,510.

FMC Corporation: *See—*
Ramaker, Dudley D.; and Keller, Roger W., 3,927,513.
Reimers, James L.; and Miller, Rodney D., 3,927,976.

Foell, Theodore J.; and Yardley, John P., to American Home Products Corporation. P-Glu-D-Phe-Trp-Ser-Tyr-D-Phee-Leu-Arg-Pro-Gly-NH2 and intermediates. 3,928,307, Cl. 260-112.5LH.

Fohlen, George M.; Parker, John A.; and Sawko, Paul M., to United States of America, General Counsel-Code GP. Transparent fire resistant polymeric structures. 3,928,708, Cl. 428-412.000.

Fokakis, Nicholas J.; and Woods, Paul S. Incinerator system for dry waste material. 3,927,626, Cl. 110-18.00R.

Fong, Willie, deceased: *See—*
Friedman, Mendel; Ash, John F.; and Fong, Willie, deceased, 3,927,962.

Fong, Yukiye, executrix: *See—*
Friedman, Mendel; Ash, John F.; and Fong, Willie, deceased, 3,927,962.

Fontaine, Michel J. Injectable glycoproteins containing terminal "C" ends of human immunoglobulins. 3,928,580, Cl. 424-177.000.

Ford, James A., to Kirsch Company. Positively supported cam for engaging a traverse rod. 3,927,437, Cl. 16-94.00R.

Ford, James A.; and Butt, Sheldon H., to Olin Corporation. Catalyst for the reduction of automobile exhaust gases. 3,928,234, Cl. 252-455.00R.

Ford Motor Company: *See—*
Chang, Yun-Feng; Cheung, Mo-Fung; and Dickie, Ray A., 3,928,273.

Formall, Inc.: *See—*
McCall, John W., 3,927,760.

Formica International Limited: *See—*
Gibbons, Harold, 3,928,706.

Forrister, John J. Apparatus and method for producing a compressed, rolled package of resilient material. 3,927,504, Cl. 53-21.0FW.

Forsberg, Svante; Larbo, Stig; and Stephensen, Bjorn, to Allmanna Svenska Elektriska Aktiebolaget. Transformer winding with helically wound layers of a tape-like conductor. 3,928,832, Cl. 336-70.000.

Foster, Homer R.: *See—*
Harrell, William C.; and Foster, Homer R., 3,928,012.

Foster, James W. Clothing belt buckles. 3,927,442, Cl. 24-163.00K.

Foster, Victor W.: *See—*
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Foster Wheeler Energy Corporation: *See—*
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Foster, William R.: *See—*
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Fowler, John T.: *See—*
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Fox, Michael Frank: *See—*
Saunders, Peter Anthony; Fox, Michael Frank; Fagan, Anthony Francis; and Derbyshire, Philip Edward, 3,928,216.

Fox, Murray J. Stacking collar for warehousing and transporting sheet material. 3,927,764, Cl. 206-451.000.

Franck, Jean-Pierre: *See—*
Torck, Bernard; Franck, Jean-Pierre; and Derrien, Michel, 3,928,488.

Frank, Kjell: *See—*
Broms, Anders; and Frank, Kjell, 3,928,794.

Frankel, Edwin N., to United States of America, Agriculture. Selective hydrocarboxylation of unsaturated fatty compounds. 3,928,231, Cl. 252-413.000.

Frankenfeld, John W.: *See—*
Wright, Donald L.; and Frankenfeld, John W., 3,928,557.

Frantz, Lanier. Testing fitting for pressure-responsive devices. 3,927,553, Cl. 73-4.00R.

Frazier, Arthur E., to Phillips Petroleum Company. Pelleting carbon black. 3,927,988, Cl. 23-314.000.

Frazzini, Giuseppe: *See—*
Vannini, Paolo; Anselmino, Luigi; and Frazzini, Giuseppe, 3,928,780.

Frederick, Leonard L. Pile driving moving cylinder hammer with valved, fixed piston. 3,927,722, Cl. 173-125.000.

Freeman, Jere E.; Abdullah, Mukhtar; and Bocan, Byron J., to CPC International Inc. Process for wet milling corn. 3,928,631, Cl. 426-18.000.

Freeman, Lawrence M.; and Arnold, Francis T. Drive system with mechanical time delay. 3,927,935, Cl. 355-14.000.

Freeman, William H.; and Williamson, Herschel M., to Caterpillar Tractor Co. Method and apparatus for removing plungers from piston assemblies. 3,927,462, Cl. 29-427.000.

French, Walter K., to Seagrave Corporation, The. Method for the direct manufacture of tempered glass sheets from a ribbon of glass. 3,928,013, Cl. 65-97.000.

Frendberg, Arthur M.: *See—*
Dungey, Harold J.; and Frendberg, Arthur M., 3,927,646.

Fried, John H.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,928,379.

Friedman, Mendel; Ash, John F.; and Fong, Willie, deceased (by Fong, Yukiye, executrix), to United States of America, Agriculture. Non-discoloring flame resistant wool. 3,927,962, Cl. 8-17.000.

Friedman, Mendel: *See—*
Koenig, Nathan H.; and Friedman, Mendel, 3,927,969.

Friedrich Kocks GmbH: *See—*
Herchenroder, Johannes, 3,927,867.

Friese, Karl-Hermann: *See—*
Esper, Friedrich J.; Friese, Karl-Hermann; and Pollner, Rudolf, 3,928,837.

Friis, Walter, Jr.; and Rudzik, Allan D., to Upjohn Company, The. Novel method and compositions. 3,928,589, Cl. 424-244.000.

Fritsche, G. Ray; and Haniak, Leonard W., to Gulf Research & Development Company. Electrofilter. 3,928,158, Cl. 204-188.000.

Fritz, Hans: *See—*
Werle, Eugen; Fritz, Hans; and Schult, Harald, 3,928,305.

Friz, Helmut A.; and Grube, Dieter, to Adolf Friz Gesellschaft mit beschrankter Haftung. Apparatus for charging panels into a press. 3,927,612, Cl. 100-215.000.

Froehlich, Leonhard H.; and Dowell, Arthur M., Jr., to Tee-Pak, Inc. Method for forming processed meats. 3,928,651, Cl. 426-641.000.

Fryar, Durward, to Procter & Gamble Company, The. Vacuum deaerator for viscous liquids. 3,928,003, Cl. 55-41.000.

Frye, Clifton G.; and McBride, Warren L., to Standard Oil Company. Method of controlling catalyst deposits in hydrodesulfurization. 3,928,178, Cl. 208-210.000.

Fugi Xerox Co., Ltd.: *See—*
Sakaue, Fukumatsu, 3,927,638.

Fuji Oil Company, Ltd.: *See—*
Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, 3,928,635.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Yokota, Yukio; Tanaka, Mitsugu; and Inouye, Kozo, 3,928,044.
Iwasa, Masakazu; Miyatuka, Hajime; Horikawa, Kazuo; and Wakabayashi, Tomisaku, 3,928,655.
Matsukawa, Hiroharu; and Hayashi, Takao, 3,928,702.
Nakazawa, Yoshiyuki; Nakamura, Yashuharu; Nakajima, Yosuke; Matsuyama, Junichi; and Sato, Akira, 3,928,856.
Shimamura, Isao; and Iwano, Haruhiko, 3,928,040.
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Fuji Photo Optical Co., Ltd.: *See—*
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Fuji Xerox Co., Ltd.: *See—*
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Fujii, Kihiro: *See—*
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Fujiki, Konosuke: *See—*
Morita, Shiro; Fujiki, Konosuke; and Takeda, Kazuo, 3,928,208.

Fujikura, Suguru: *See—*
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Fujino, Hidekazu: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Fujino, Hidekazu; Tanimoto, Kenji; Hosaka, Hirokazu; Ehara, Kazunari; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; and Yasuda, Minoru, 3,928,469.

Fujino, Shinichiro: *See—*
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Fujisawa Pharmaceutical Co., Ltd.: *See—*
Umio, Suminori; Ueda, Ikuo; Sato, Yoshinari; and Maeno, Shizuo, 3,928,356.

Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, to Kuraray Co., Ltd. Process for preparing farnesyl acetic acid esters and 2-substituted-products thereof. 3,928,403, Cl. 260-410.90N.

Fujiwhara, Mitsuto; Endo, Takaya; Satoh, Ryosuke; Masukawa, Toyoaki; and Uozumi, Takahiro, to Konishiroku Photo Industry Co., Ltd. Development inhibitor yielding compound for silver halide photography. 3,928,041, Cl. 96-66.300.

Fukao, Masami: *See—*
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Fukasawa, Atsushi: *See—*
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Fukuda, Masaaki: *See—*
Watatani, Yoshizumi; Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,928,720.

Fukuda, Yoshiharu; Onishi, Toshio; and Takeuchi, Akitoshi, to Onoda Cement Company, Ltd. Method of improving the grade of phosphoric acid by-product gypsum to be used as an inhibitor for cement setting and its apparatus. 3,928,053, Cl. 106-109.000.

Fukuhara, Satoru: *See—*
Hosoki, Shigeru; Ohtsuka, Michio; and Fukuhara, Satoru, 3,928,783.

Fukui, Nobuhiko: *See—*
Masai, Yukito; Kato, Yasuo; Murayama, Ken; and Fukui, Nobuhiko, 3,928,283.

Fukunishi, Koji: *See—*
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Fuller Company: *See—*
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Furukawa Electric Co., Ltd., The: *See—*
Kashiyama, Hiroshi; and Tobita, Susumu, 3,928,519.

Furuno, Kouji; Nakano, Hideki; Matsubara, Syuzo; and Shioya, Akitoshi, to Chugai Seiyaku Kabushiki Kaisha. Method for reducing side effects of aminoglycoside antibiotics. 3,928,583, Cl. 424-180.000.

Furuta, Akio: *See—*
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Fuveau S.A.: *See—*
Moreau, Michele; Karadavidoff, Isaac; and Risse, Claude, 3,928,603.

Fuwa, Masaru; Takahashi, Kiyoshi; Otsuji, Masaaki; and Matsui, Masatake, to Mitsubishi Petrochemical Co., Ltd.; and Dainichi-Nippon Cables, Ltd. Method for forming and vulcanizing vulcanizable materials. 3,928,525, Cl. 264-174.000.

Fuzesi, Stephen; and Syrop, Allan H., to Olin Corporation. Reduction of friability in rigid polyurethane foam. 3,928,257, Cl. 260-2.5AS.

G.S. Beckwith Gilbert: *See—*
Herrmann, John R.; and Alexander, Robert L., 3,927,950.

GAF Corporation: *See—*
Randall, David I.; and Wynn, Robert W., 3,928,018.

Galarza, Ernesto Felix. Indoor soccer ball. 3,927,882, Cl. 273-65.00E.

Gall, Rudi: *See—*
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Gallay, Jean-Jacques: *See—*
Spaun, Rudiger; Rochat, Alain Claude; Gallay, Jean-Jacques; and Brenneisen, Paul, 3,928,437.

Gannon, Charles R., to Ashland Oil, Inc. Pitch-impregnated fiber pipe. 3,927,696, Cl. 138-243.000.

Gannon, Charles R., to Ashland Oil, Inc. Process for making pitch-impregnated fiber pipe. 3,928,680, Cl. 427-398.000.

Garcia, Fe, to Rosenblum, Saul A., a part interest. Device for sealing body cavity during introduction of fluid to or extraction of fluid from said cavity. 3,927,672, Cl. 128-245.000.

Gardner, John: *See—*
Lavochkin, Ronald B.; and Gardner, John, 3,927,802.

Garrett Corporation, The: *See—*
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Fisk, Harry R.; and Clark, Jeffrey J., 3,928,029.
Kirby, Robert F., 3,927,952.
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Struttmann, Donald R.; and Ryan, William F., 3,927,694.

Garrigoux, Joseph: *See—*
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Gartner, Jurgen: *See—*
Linden, Heinz; Gartner, Jurgen; Offermann, Wilhelm; and Demmering, Gunther, 3,928,276.

Gasbarro, Geno N. Method for marinating poultry products. 3,928,634, Cl. 426-281.000.

Gates Rubber Company, The: *See—*
Douros, John D., Jr.; and Kerst, Al F., 3,928,017.

Gatewood, Askew Warren, Jr. Inventory device for packaged items. 3,927,922, Cl. 312-234.000.

Gatsis, John G., to Universal Oil Products Company. Process for hydrorefining a residual hydrocarbon. 3,928,179, Cl. 208-213.000.

Gault, Ian Ray, to Colgate-Palmolive Company. Speckle particle for dentifrice. 3,928,555, Cl. 424-22.000.

Gebr. Bohler & Co. AG: *See—*
Kleinhagauer, Otmar, 3,927,855.

Gebr. Happich GmbH: *See—*
Meissner, Wolfgang, 3,927,846.

Gebr. Hofmann KG: *See—*
Schleimann, Peter, 3,927,561.

Geddes, Paul E., to GNP Plastics Corporation. Male and female urinal. 3,927,426, Cl. 4-110.000.

Geiger, Erich, to Loewe-Opta GmbH. Energy stabilization in a horizontal deflection circuit for a television receiver. 3,928,787, Cl. 315-403.000.

Gendron, Aubrey S.; Tilak, Bommaraju V.K.S.R.A.; and Ettel, Victor A., to International Nickel Company, Inc., The. Electrowinning process. 3,928,153, Cl. 204-112.000.

General Concrete of Canada Limited: *See—*
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General Dynamics Corporation: *See—*
Caron, Norman O., 3,927,623.
General Electric Company: *See—*
Buchanan, Edward R.; and Tarshis, Lemuel A., 3,928,030.
Campbell, John H., 3,928,786.
Cech, Robert E., 3,928,089.
Fishman, Herbert; and Kresge, James S., 3,928,245.
Godwin, Stanley J.; and Klint, Robert V., 3,927,555.
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May, John E., 3,928,242.
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Pustell, Robert Algerd; and Haselton, Thomas Parker, 3,927,928.
Sliva, Daniel E.; and Selley, William G., 3,928,516.
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General Foods Corporation: *See—*
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General Mills Chemicals, Inc.: *See—*
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General Motors Corporation: *See—*
Arvin, John R.; Sullivan, Robert E.; and Troth, Dennis L., 3,927,520.
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Jacobs, James W., 3,927,525.
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General Signal Corporation: *See—*
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General Staple Company: *See—*
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Fabris, Hubert J.; and Phillips, Wendell O., 3,928,502.
Hargis, Ivan Glen; and Livigni, Russell Anthony, 3,928,302.
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George G. Sharp, Inc.: *See—*
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George Kent, Limited: *See—*
Rogers, Ivor Thomas, 3,927,451.
Georgiade, Nicholas G.; and Latham, Ralph A., to University of North Carolina, by said Ralph A. Latham. Apparatus for use in the correction of maxillary and premaxillary conditions in infants. 3,927,664, Cl. 128-76.00R.
Gerber Garment Technology, Inc.: *See—*
Gerber, Heinz Joseph, 3,927,591.
Gerber, Heinz Joseph, to Gerber Garment Technology, Inc. Support bed for sheet material cut by a fluid jet. 3,927,591, Cl. 83-177.000.
Gerbier, Gerard; and Depoix, Pierre, to Saft-Societe des Accumulateurs Fixes et de Traction. Air depolarized electric cell. 3,928,072, Cl. 136-86.00A.
Gerrard, Alan Joseph, to Lucas Aerospace Limited. Liquid atomising devices. 3,927,835, Cl. 239-400.000.
Gerritsma, Cornelis Jan: *See—*
van Boxtel, Antonius Marinus; and Gerritsma, Cornelis Jan, 3,928,658.
Gianessi, Albert, to Caterpillar Tractor Co. Apparatus for detachably mounting an engine belly guard to a vehicle main frame. 3,927,729, Cl. 180-69.100.
Gibble, Lawrence W.; and Keesey, Dennis Lee, to Caterpillar Tractor Co. Formed one-piece hollow roller shaft. 3,927,449, Cl. 29-148.40D.
Gibbons, Harold, to Formica International Limited. Wear-resistant decorative laminates and methods for producing same. 3,928,706, Cl. 428-323.000.
Giblon, Robert P., to George G. Sharp, Inc. Jack-up type offshore oil production platform apparatus and method. 3,927,535, Cl. 61-46.500.
Giebel, Buddy E., to Union Camp Corporation. Carton with improved ends. 3,927,822, Cl. 229-23.00R.
Gilbreth Company: *See—*
Spiegel, William; Spiegel, Jacob; and Miller, Albert, 3,927,484.
Gildone, Anthony M.: *See—*
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Gilford, Ira B.: *See—*
Glass, Marvin I.; Morrison, Howard J.; and Gilford, Ira B., 3,927,884.
Gilles, Theodore C., to Lennox Industries Inc. Energy reclaiming multizone air processing system. 3,927,713, Cl. 165-16.000.
Gilron Holdings Limited: *See—*
Tindley, Ronald John, 3,927,799.
Gingell, Michael J., to International Standard Electric Corporation. Code translation arrangement. 3,928,823, Cl. 332-11.00R.
Giordano, Nicola: *See—*
Pignataro, Francesco; Faletti, Franco; Castellan, Arsenio; Bossi, Alessandro; Marinozzi, Paolo; and Giordano, Nicola, 3,928,409.
Giraud, Adrien: *See—*
Pavlin, Cyrille Francois; Mantoux, Gerard; Giraud, Adrien; and Grossin, Michele, 3,927,565.
Girke, Dieter: *See—*
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Gist-Brocades N.V.: *See—*
Van Eek, Theodoor; and Beukers, Robert, 3,928,573.
GKN Transmissions Limited: *See—*
Pagdin, Brian Colin, 3,927,653.
Glaser, Ernest; and Ingerson, Philip F., to Avoset Food Corporation. Egg substitute product. 3,928,632, Cl. 426-72.000.
Glass, Marvin I.; Morrison, Howard J.; and Gilford, Ira B., to Marvin Glass & Associates. Surface projectile amusement device. 3,927,884, Cl. 273-119.00R.
Glass Tubes and Components Limited: *See—*
Chambers, Arnold, 3,927,873.
Glatt, Linda R. Bandage construction. 3,927,669, Cl. 128-156.000.
Glavna Directzia Kbumkp Pri Sgns: *See—*
Anastasov, Ivan Krestev, 3,927,543.
Globe-Union Inc.: *See—*
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Glowe, Donald E.: *See—*
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GMF Inc.: *See—*
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GNP Plastics Corporation: *See—*
Geddes, Paul E., 3,927,426.
Gobeli, David H.; and Adams, John M., to Medtronic, Inc. Demand cardiac pacer. 3,927,677, Cl. 128-419.0PG.
Gobert, Jean, Georges; and Close, Jean, Adolphe, to UCB Societe Anonyme. Lysino-calcium chloride and pharmaceutically acceptable acid salts thereof. 3,928,506, Cl. 260-924.000.
Godwin, Stanley J.; and Klint, Robert V., to General Electric Company. Hydrogen detector system. 3,927,555, Cl. 73-23.000.
Goetzmann, Claus, to Siemens Aktiengesellschaft. Nuclear reactor element. 3,928,129, Cl. 176-38.000.
Gogarty, William B.: *See—*
Dreher, Karl D.; and Gogarty, William B., 3,928,215.
Golan, Kenneth Frank, to Caterpillar Tractor Co. Down shift inhibitor system for automatic transmission control. 3,927,579, Cl. 74-752.00C.
Goldberg, Paul; and van Heerden, Pieter J., to Polaroid Corporation. Light polarization employing magnetically oriented ferrite suspensions. 3,927,930, Cl. 350-151.000.
Goldovsky, Evgeny Alexandrovich: *See—*
Berlin, Alfred Anisimovich; Aseeva, Roza Mikhailovna; Mezhikovsky, Semen Markovich; Sherle, Alla Ilinichna; Tsepalova, Nadezhda Alexeevna; Goldovsky, Evgeny Alexandrovich; Zelenetskaya, Tatiana Vladimirovna; Fatkulina, Rozalia Komalovna; and Kuzminsky, Alexandr Samoilovich, 3,928,489.
Gondo, Hisashi; Takechi, Hiroshi; Namba, Kazuo; Usuda, Matsuo; and Kawasaki, Kouichi, to Nippon Steel Corporation. Process for producing an enamelling steel sheet. 3,928,083, Cl. 148-2.000.
Goodell, Paul Douglas. Catalyst for purification of waste streams. 3,928,235, Cl. 252-458.000.
Goodfellow, Robert Charles: *See—*
Rowe, Stephen Henry; Bass, John Charles; and Goodfellow, Robert Charles, 3,928,102.
Goodyear Aerospace Corporation: *See—*
Zarembka, Robert L., 3,927,740.
Goodyear Tire & Rubber Company, The: *See—*
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Persinski, Leonard John; Ralston, Paul Hotchkiss; and Gordon, Robert Cornelius, Jr., 3,928,196.
Gordon, Robert E.; Jones, Robert W.; Paul, Rajendra; and Simon, Robert H. M., to Monsanto Company. Continuous staged isobaric stirred polymerization apparatus. 3,927,983, Cl. 23-260.000.
Goto, Kenji; and Niwa, Takao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Structure of the combination chamber of internal combustion engines. 3,927,655, Cl. 123-191.00R.
Goto, Sumio; and Ishihara, Kazuhiko, to Dai-ichi Kogyo Seiyaku Co., Ltd. Harmless softening agent for fabrics having excellent moisture absorbability. 3,928,212, Cl. 252-8.600.

Gotte, Hans: *See*—
Bock, Hartmut; and Gotte, Hans, 3,928,764.

Gough, Robert George; and Buescher, Francis Joseph, to Cincinnati Milacron, Inc. Synergistic organotin borate stabilizer composition and resins containing same. 3,928,285, Cl. 260-45.75K.

Goward, George W.: *See*—
Hecht, Ralph J.; Goward, George W.; and Elam, Richard C., 3,928,026.

Graco Inc.: *See*—
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Grahame, Robert E., Jr.: *See*—
Hubbard, Winchester L.; Grahame, Robert E., Jr.; Covey, Rupert A.; and Jancis, Elmar H., 3,928,617.

Grant, Peter M., to Eastman Kodak Company. Process for producing polyolefin powders with grinding aids and powder composition of grinding aids and polyolefins. 3,928,263, Cl. 260-17.00R.

Graupmann, Lloyd Earl, to Chromalloy American Corporation. Ramp for transporting wheel mounted machinery. 3,927,775, Cl. 214-85.000.

Graven, Richard G.: *See*—
Davis, Francis E., Jr.; Graven, Richard G.; Lee, Wooyoung; and Sailor, Robert A., 3,928,172.

Gray, Don N.: *See*—
Crawford, James E.; and Gray, Don N., 3,928,294.

Grayson, John T. Turkey call. 3,927,490, Cl. 46-189.000.

Great Plains Bag Corporation: *See*—
Stearley, Robert J., 3,927,825.

Greco, Carl C.; Mirviss, Stanley B.; and Martell, Arthur E., to Stauffer Chemical Company. Process for the production of complex mixtures of N-benzyl-dihydro-nicotinic acid dimers and metal salts thereof and derivatives thereof. 3,928,365, Cl. 260-295.50R.

Green, Harold; and Halasz, Stephen J., to Veriprint Systems Corporation. Fingerprint comparator. 3,928,842, Cl. 340-146.30Q.

Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Anti-microbial quaternary ammonium co-polymers. 3,928,323, Cl. 260-239.00B.

Greenberg, Walter H., to Beschoff Chemical Corporation. Low pressure injection molding involving mold fill detection. 3,928,518, Cl. 264-40.000.

Greene, James M.; and Indelicato, Joseph M., to Eli Lilly and Company. Antibiotic pharmaceutical compositions. 3,928,592, Cl. 424-246.000.

Greenlee Bros. and Co.: *See*—
Linquist, Wayne A., 3,927,866.

Greenspan, George; and Leeming, Michael R. G., to American Home Products Corporation. Microbiological reduction of 7-(2(3-hydroxy-1-octenyl)-5-oxo-3-cyclopentel-1-yl)-5-heptenoic acid and related compounds. 3,928,134, Cl. 195-30.000.

Greenwald, Harry; and Iglio, Salvatore, to Walter Kidde & Co., Inc. Lockable coin slide assembly. 3,927,750, Cl. 194-97.00R.

Gregan, Dorsey J. G.: *See*—
Sinsky, Joel A.; and Gregan, Dorsey J. G., 3,927,552.

Gregg, David W.; and Pearson, Richard K., to United States of America, Energy Research and Development Administration. High energy chemical laser system. 3,928,821, Cl. 331-94.50G.

Gregor, Vaughn. Automatic material-handling apparatus. 3,927,758, Cl. 198-89.000.

Gregory, Donald Dale; and Wendel, Martin Maurice, to Du Pont de Nemours, E. I., and Company. Manufacture of nitrites. 3,928,543, Cl. 423-385.000.

Greve, Heinz Gunter; and Resag, Klaus, to Cassella Farbwerke Mainkur AKT. Benzophenone derivatives and process for their production II. 3,928,415, Cl. 260-470.000.

Griffin, Ronald W. Fire starter and method. 3,927,993, Cl. 44-39.000.

Griffiths, Darrell J. L.; and Huang, Denis K., to Westvaco Corporation. Paper containing a urea-formaldehyde pigment. 3,928,122, Cl. 162-166.000.

Grindley, Robert M.; and Strong, Michael J., to International Audio-Visual Hong Kong Ltd. Tape duplicating device. 3,928,868, Cl. 360-15.000.

Griot, Rudolf G., to Sandoz, Inc. Aminoalkoxy-terphenyls and the salts thereof. 3,928,449, Cl. 260-570.700.

Griswold, Augustus W.; and Haritonoff, Boris W. Microfiche deleter apparatus. 3,927,586, Cl. 83-8.000.

Gronbach, Wilhelm. Hinge. 3,927,439, Cl. 16-190.000.

Grossin, Michele: *See*—
Pavlin, Cyrille Francois; Mantoux, Gerard; Giraud, Adrien; and Grossin, Michele, 3,927,565.

Grube, Dieter: *See*—
Friz, Helmut A.; and Grube, Dieter, 3,927,612.

Grulke, Carl A., deceased (by Grulke, Elizabeth N., executrix), to Union Carbide Corporation. Process for recovering HCl and Fe_2O_3 from pickle liquor. 3,928,529, Cl. 423-138.000.

Grulke, Elizabeth N., executrix: *See*—
Grulke, Carl A., deceased, 3,928,529.

Grunwell, Joyce F.; and Benson, Harvey D., to Richardson-Merrell Inc. Derivatives of 7α-methylestr-4-en-3α,17β-diol. 3,928,398, Cl. 260-397.500.

Gruppo Lepetit S.p.A.: *See*—
Lancini, Giancarlo; and Thiry, Lise, 3,928,593.
Winters, Giorgio; and Di Mola, Nunzio, 3,928,371.

GTE Laboratories Incorporated: *See*—
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GTE Sylvania Incorporated: *See*—
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Gudmestad, Ragnar; and Sandblom, Sven O., to Artos Engineering Company. Apparatus for producing electrical conductors of measured length. 3,927,590, Cl. 83-151.000.

Guglieri, Michel: *See*—
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Guinosso, Charles J.: *See*—
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Guldin, Maxwell: *See*—
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Gulf Research & Development Company: *See*—
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Onopchenko, Anatoli; and Schulz, Johann G. D., 3,928,433.

Gulf & Western Manufacturing Company: *See*—
Weyrauch, George L., 3,927,898.

Gulick, Ronald A.: *See*—
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Gunsagar, Kamleshwar: *See*—
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Gunther, Dieter: *See*—
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Gunther, Ronald G., to Yardney Electric Corporation. Electrolyte for organic electrolyte cells. 3,928,070, Cl. 136-83.00R.

Gupta, Monoj Kumar, to Procter & Gamble Company, The. Dry prepared muffin mixes comprising impact-milled hard wheat flour. 3,928,647, Cl. 426-554.000.

Guth, Lauren W., to General Electric Company. Household appliance leveling system. 3,927,853, Cl. 248-188.200.

Guzzo, Anthony T., to Thiokol Corporation. Method and apparatus for making ammonium perchlorate. 3,928,546, Cl. 423-476.000.

H. H. Investments Limited: *See*—
Bramhill, Percy W., 3,927,681.

Haas, Georges; Sallmann, Alfred; and Rossi, Alberto, to Ciba-Geigy Corporation. Alpha-[p-(1-cyclolower alkenyl)-phenyl]lower fatty acid-pyridyl-lower alkyl esters and derivatives. 3,928,363, Cl. 260-295.50R.

Haas, Hans: *See*—
Aicher, Albrecht; Diem, Hans; Haas, Hans; Hess, Klaus; Hussy, Oskar; Matthias, Guenther; Sperber, Heinrich; and Stickel, Richard, 3,928,460.
Diem, Hans; Matthias, Guenther; Aicher, Albrecht; Haas, Hans; Schreiber, Hans; and Sperber, Heinrich, 3,928,461.

Habermeier, Jurgen, to Ciba-Geigy Corporation. Di-(hydroxyalkyl) imidazolidinediones. 3,928,377, Cl. 260-309.500.

Habrovec, Frantisek: *See*—
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 3,927,450.

Hack, Heinrich, to Carl Schenck AG, Firma. Apparatus for transporting and adjusting rotative workpieces. 3,927,909, Cl. 294-81.00R.

Hagberg, Carl G., to Monsanto Company. Falling strand devolatilization technique. 3,928,300, Cl. 260-93.50A.

Hagemeyer, Hugh J., Jr.; Blood, Alden E.; and Snapp, Thomas C., Jr., to Eastman Kodak Company. Synthesis of alpha, beta-unsaturated esters, aldehydes, ketones and nitriles. 3,928,458, Cl. 260-593.00R.

Hahn, Peter A.: *See*—
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Hairabedian, Barouyr Zareh: *See*—
Edwards, Roger Joseph; Hairabedian, Barouyr Zareh; and Poley, Neil Myron, 3,928,781.

Hakansson, Sven Anders Samuel, to Kommanditbolaget United Stirling (Sweden) AB & Co. Multi-cylinder double-acting stirling cycle engines. 3,927,529, Cl. 60-521.000.

Halasz, Stephen J.: *See*—
Green, Harold; and Halasz, Stephen J., 3,928,842.

Halcon International, Inc.: *See*—
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Hall, James M.; and Clipp, Louis L., to Exotech, Incorporated. Apparatus for drilling holes utilizing pulsed jets of liquid charge material. 3,927,723, Cl. 175-422.000.

Hallerberg, Karl Josef, to Borg-Warner, GmbH. Cage for overrunning roller clutch. 3,927,744, Cl. 192-45.000.

Halliburton Company: *See*—
Clement, Clarence C., Jr., 3,928,052.
Hyde, Walter E., 3,927,556.

Hamalainen, Lauri: *See*—
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Hambsch, Erich; Klug, Helmut; Ortner, Herbert; Semmlinger, Walter; and Wirtz, Rudolf, to Hoechst Aktiengesellschaft. Method for working up chloropolyolefin solutions. 3,928,503, Cl. 260-897.00C.

Hamilton, C. Howard; and Ascani, Leonard A., Jr., to Rockwell International Corporation. Method for making metallic sandwich structures. 3,927,817, Cl. 228-157.000.

Hamilton, Charles R.: *See*—
Hoelzen, Warren R.; Hamilton, Charles R.; and Warnock, James E., 3,927,617.

Hamilton, Willard C.; and Wegman, Raymond F., to United States of America, Army. Process for producing stabilized anatase titanium dioxide surfaces for durable adhesive bonding. 3,928,112, Cl. 156-319.000.

Hammann, Ingeborg; Hoffmann, Peter; Marquarding, Dieter; Ugi, Ivar; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft. Isocyanodiphenyl ethers. 3,928,408, Cl. 260-465.00F.

Hammann, Ingeborg: *See*—
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Hanado, Masanao; Takamoku, Kensi; Miyoshi, Tsutomu; and Jeng, Shien Tsai, to Tanita Corporation. Digital display type weighing apparatus. 3,927,726, Cl. 177-213.000.
Hanagan, Michael W., to Corbin Gentry Inc. Vehicular seat and fairing assembly. 3,927,727, Cl. 180-30.000.
Hanai, Ichiro; Takahashi, Kazuo; and Kobayashi, Toshiharu, to Sony Corporation. Thermal printing apparatus. 3,928,747, Cl. 219-216.000.
Handa, Kenichi, to Fuji Xerox Co., Ltd. Developing mechanism using magnetic brush. 3,927,641, Cl. 118-637.000.
Hane, Toshihide: *See*—
Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; and Kihara, Nobuyoshi, 3,928,719.
Haney, Ted I.: *See*—
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Hans Ehgartner, Firma: *See*—
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Hansen, Victor Emanual. Fabric edge curler member for a paper machine. 3,928,124, Cl. 162-274.000.
Hanslik, Wilhelm, to Krauss-Maffei Aktiengesellschaft. Multiscrew extruder. 3,927,869, Cl. 259-192.000.
Harada, Hiroshi: *See*—
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Harada, Shunichi; and Abe, Hideo, to Kawasaki Steel Corporation. Pretreating process for vitreous enamelling. 3,927,460, Cl. 29-424.000.
Harada, Toshiaki: *See*—
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Harberson, Loyd D.: *See*—
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Hardinge Brothers, Inc.: *See*—
Parsons, Hubert J.; and Peterson, Anders Adolf, 3,927,583.
Haren, Doyle V.; and Logan, Arthur D., to Dayco Corporation. Method of making microporous elastomeric material. 3,928,521, Cl. 264-49.000.
Hargis, Ivan Glen; and Livigni, Russell Anthony, to General Tire & Rubber Company, The. Alkaline earth metal organometallic compounds, their preparation by metallation and catalysts comprising same. 3,928,302, Cl. 260-94.300.
Harigaya, Hiroshi; Kanai, Masao; and Kano, Toshio, to Kabushiki Kaisha Suwa Seikosha. Semiconductor device and process for manufacturing same. 3,928,095, Cl. 148-188.000.
Harigaya, Hiroshi: *See*—
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Haritonoff, Boris W.: *See*—
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Harkison, Norman W., to A-T-O Inc. Spraying. 3,927,539, Cl. 68-3.00R.
Harkness, Samuel D., to United States of America, Energy Research and Development Administration. Nonswelling alloy. 3,928,027, Cl. 75-139.000.
Harrell, William C.; and Foster, Homer R., to PPG Industries, Inc. Method and apparatus for regulating the temperature of a glass sheet float tank. 3,928,012, Cl. 65-65.00A.
Harrington, Edward F., Jr., to Chemetron Corporation. Method of installing cylindrical bellows. 3,927,818, Cl. 228-189.000.
Harris, Alan James: *See*—
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Harris, Jesse P. T.: *See*—
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Harris, Timothy L. Curve-drawing apparatus. 3,927,477, Cl. 33-177.000.
Harrison, David; and Sainz, Raul T., to Ransburg Corporation. Apparatus for forming multiple-component composite structures. 3,927,833, Cl. 239-306.000.
Harrison, Derek Ralph: *See*—
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Hart, Donald R.: *See*—
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Hartdegen, Frank J.: *See*—
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Hartley, Frederick J., to General Motors Corporation. Catalytic converter bed support means. 3,927,984, Cl. 23-288.00F.
Hartley, Howard A., to Cannell Auto-Process Corporation. Method for blending temperature sensitive ingredients in the production of dough. 3,928,646, Cl. 426-549.000.
Hartwick, Thomas S.; and Hodges, Dean T., Jr., to United States of America, Air Force. Far infrared waveguide laser. 3,928,816, Cl. 331-94.50C.
Harvey, Walter W.; Randlett, Myron R.; and Bangerskis, Karlis L., to Kennecott Copper Corporation. Method for the electrolytic recovery of metal employing improved electrolyte convection. 3,928,152, Cl. 204-106.000.
Hasegawa, Shinichi: *See*—
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Haselton, Thomas Parker: *See*—
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Hatayama, Katsuo: *See*—
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Hayes, Douglas R.; and Phipps, Charles M., to United Technologies Corporation. Joining of multi-section ceramic molds. 3,927,710, Cl. 164-25.000.
Hayes, John C., to Universal Oil Products Company. Hydrocarbon conversion with a multimetallic catalytic composite. 3,928,177, Cl. 208-139.000.
Haynes, Harold L.: *See*—
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Hebel, Robert Newman, Jr. Underwater wall structure. 3,927,533, Cl. 61-4.000.
Hecht, Ralph J.; Goward, George W.; and Elam, Richard C., to United Technologies Corporation. High temperature nicocraly coatings. 3,928,026, Cl. 75-134.00F.
Hedge, John A.; Suld, George; and Urban, Ralph L., to Sun Ventures, Inc. Process for conversion of alkyldecalins and/or alkyltetralins. 3,928,482, Cl. 260-668.00F.
Hedge, John A.: *See*—
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Hedvall, Per; Lampe, Wolfgang; and Spicar, Erich, to Allmanna Svenska Elektriska Aktiebolaget. Means for measuring the temperature in electrical machines. 3,927,570, Cl. 73-350.000.
Heerdt, Ruth: *See*—
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Heeres, Jan; Mostmans, Joseph Hector; and Maes, Robert, to Janssen Pharmaceutica N.V. Nitroimidazole derivatives. 3,928,374, Cl. 260-309.000.
Heick, Robert Bruce: *See*—
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Heidingsfeld, Viktor; Hudecek, Slavko; Hnidek, Jaroslav; Kolarik, Jan; and Zelinger, Jiri, to Ceskoslovenska akademie ved. Method for producing thin-walled articles from plastics. 3,928,704, Cl. 428-260.000.
Heiskell, Raymond H.: *See*—
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Helinski, Edward F.; Lee, Ho C.; and Zable, Jack L., to International Business Machines Corporation. Method and apparatus for controlling satellites in an ink jet printing system. 3,928,855, Cl. 346-1.000.
Hellmuth, Walter W.: *See*—
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Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erik, to Mo och Damsjo Aktiebolag. Asphalt compositions having improved adhesion to aggregate. 3,928,061, Cl. 106-273.00N.
Hellwarth, Robert W., to Hughes Aircraft Company. Method and apparatus for operating laser. 3,928,815, Cl. 331-94.50Q.
Helsby, Graham Harry: *See*—
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Henkel & Cie G.m.b.H.: *See*—
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Henrick, Clive A.; and Staal, Gerardus B., to Zoecon Corporation. Cyclopropanemethyl esters. 3,928,413, Cl. 260-469.000.
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Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 3,927,697.
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Hercules Incorporated: *See—*
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Hergenrother, William L., to Firestone Tire & Rubber Company, The. Block polymers of polysiloxanes and polybutadiene. 3,928,490, Cl. 260-827.000.
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Herrmann, John R.; and Alexander, Robert L., to G.S. Beckwith Gilbert. Half-lapped tube joint. 3,927,950, Cl. 403-346.000.
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Hill, Maynard L., to Johns Hopkins University, The. Method and apparatus for sensing rate of angular displacement. 3,928,801, Cl. 324-160.000.
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Hoelzen, Warren R.; Hamilton, Charles R.; and Warnock, James E., to United States of America, Navy. Post-launch dual pressure sensitive arming device. 3,927,617, Cl. 102-82.000.
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Holden, Derek J., to Fiberglas Canada Limited. Automated apparatus and process for making match molded covering. 3,928,105, Cl. 156-200.000.

Holden, Homer N., to Dayco Corporation. Vacuum cleaner hose assembly and apparatus and method used in making same. 3,928,715, Cl. 174-47.000.

Holden, Thomas W. Electrical wave filter. 3,928,721, Cl. 178-88.000.

Hollander, Charles S., to New York University. Radioimmunoassay method for triiodothyronine and thyroxine. 3,928,553, Cl. 424-1.000.

Holm, Kurt Anders, to Uddeholms AB. Method for cleaning plate-shaped objects. 3,928,064, Cl. 134-6.000.

Holm, William J., to Riggs & Lombard, Inc. Guide for a moving belt. 3,927,814, Cl. 226-199.000.

Homma, Yuzuru; Abe, Chiyoji; and Shionoya, Hiroshi, to Homma, Yuzuru; Abe, Chiyoji; and Shionoya, Hiroshi. Pharmaceutical preparation of pseudomonas aeruginosa bacterial component possessing anti-tumor and anti-infection properties. 3,928,565, Cl. 424-92.000.

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Hubert, Alfred W.; and Russell, Ralph T., to Eli Lilly and Company. Process for lysing mycelial waste. 3,928,642, Cl. 426-521.000.

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Hughes, John Leonard, to Quentron Optics Pty Ltd. Laser amplifier. 3,928,811, Cl. 330-4.300.

Hugon, Jean H.; Brosseron, Jean; and Ligneres, Pierre J. Distribution function analyzer for measuring telephone equipment holding times. 3,928,803, Cl. 324-181.000.

Hugoson, Birger O.; and Rohr, Carl A., to Westinghouse Electric Corporation. Multicone exhaust diffuser system for a gas turbine. 3,927,521, Cl. 60-39.310.

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Humphrey, William E., to Humphrey Instruments, Inc. Apparatus for opthalmological prescription readout. 3,927,933, Cl. 351-17.000.

Hunter, Wood Eugene; and Hoffmann, Karl H., to Nalco Chemical Company. Raney copper catalyst production and use. 3,928,441, Cl. 260-561.00N.

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Hyttinge, Roy Lennart; Widvall, Lars Olov; and Hook, Anders Erik Ingvar, to Toa-Throne AB. Device for preparation of earth improving substances from organic waste. 3,927,985, Cl. 23-259.100.

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Ide, Tohru: *See*—
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Ikekawa, Nobuo; Morisaki, Masuo; Lightbourn, Julieta Rubio; and Seki, Masao, to Eisai Co., Ltd. New 5-cholestene derivatives and preparation thereof. 3,928,397, Cl. 260-397.200.

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Inagaki, Yasuhiro, to NCR Corporation. Record feed control mechanism. 3,927,813, Cl. 226-135.000.

Inata, Hiroo; Kawase, Shoji; and Shima, Takeo, to Teijin Limited. Glass fiber-containing aromatic polyester composition. 3,928,279, Cl. 260-40.00R.

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Ingle, James E.; Emerson, Ralph W.; and Megahan, John S., to Maxon Marine Industries, Inc. Emergency over-fill assembly for marine vessels. 3,927,702, Cl. 141-285.000.

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Inoue, Naohiko; and Moori, Youichi, to Nissan Motor Co., Ltd.; and Jidosha Denki Kogyo Kabushika Kaisha. Multiple-shaft double-motion drive mechanism. 3,927,436, Cl. 15-250.170.

Inouye, Kozo: *See*—
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Institut Francais du Petrole, des Carburants et Lubrifiants: *See*—
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Ishikawa, Toshikatsu; Endo, Tei; Masuyama, Toshio; Uruma, Fumio; Morishita, Masutaka; and Kuki, Takeshi, to Nippon Carbon Co. Ltd. Apparatus for incinerating a plastic waste. 3,927,986, Cl. 23-277.00R.

Isoda, Mikio, to Matsushita Electric Industrial Co., Ltd. Remote control system. 3,928,760, Cl. 250-199.000.

Isotopcentralen: *See*—
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Itoh, Hideyo, to Agency of Industrial Science & Technology. Mechanical hand. 3,927,424, Cl. 3-12.600.

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Ivanov, Evgeny Alexandrovich; Silchenkova, Vladislava Venediktovna; Sazonov, Alexandr Afanasievich; and Budkin, Nikolai Stefanovich. Device for the precision displacement of an article within a plane. 3,928,778, Cl. 310-8.300.

Ivester, Andrew S.; and Johnson, Bruce K., to Polaroid Corporation. Photographic film advancing and processing apparatus having a protective device. 3,928,862, Cl. 354-86.000.

Iwahashi, Kenji; and Yamamoto, Hiroshi, to Shimadzu Seisakusho Ltd. Spectrophotometer. 3,927,944, Cl. 356-97.000.

Iwamoto, Masatami: *See—*
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Iwasa, Masakazu; Miyatuka, Hajime; Horikawa, Kazuo; and Wakabayashi, Tomisaku, to Fuji Photo Film Co., Ltd. Electrostatic powder coating method. 3,928,655, Cl. 427-21.000.

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Iwatani & Co., Ltd.: *See—*
Nakayama, Hiroshi, 3,927,712.

J. K. & Susie L. Wadley Research Institute & Blood Bank: *See—*
Dorn, Gordon L., 3,928,139.

J. M. Huber Corporation: *See—*
Wason, Satish K., 3,928,541.

Jablonski, John Michael; and Miller, John, to Fisons Ltd. Process for the production of hydrozonitriles. 3,928,410, Cl. 260-465.50R.

Jablonsky, Erich, to Zahnradfabrik Friedrichshafen AG. Power steering system with reaction force limiting means. 3,927,604, Cl. 91-434.000.

Jackovitz, John F.; Pantier, Earl A.; and Wu, Christopher K., to Westinghouse Electric Corporation. Active electrode composition and electrode. 3,928,068, Cl. 136-24.000.

Jackson, Brian W., to Eastman Kodak Company. Method and apparatus for coating a substrate. 3,928,678, Cl. 427-402.000.

Jackson, Brian W.; Winkler, Dean E.; and Woodworth, Charles B., to Eastman Kodak Company. Method and apparatus for coating a multiple number of layers onto a substrate. 3,928,679, Cl. 427-402.000.

Jackson, James C.; and Harberson, Loyd D., to Ethyl Corporation. Gasket cutting apparatus. 3,927,587, Cl. 83-8.000.

Jackson, Neville, to Burgess Products Company Limited. Dry-type air filters. 3,928,007, Cl. 55-337.000.

Jacobs, James W., to General Motors Corporation. Engine with exhaust manifold converter-reactor. 3,927,525, Cl. 60-301.000.

Jacobs, John E., to United States of America, Health, Education and Welfare. Liquid crystal gas analyzer. 3,927,977, Cl. 23-230.0LC.

Jacuzzi Bros. Incorporated: *See—*
Horan, Raymond E., Jr.; and Nash, Floyd M., 3,928,197.

Jagenberg Werke AG: *See—*
Zodrow, Rudolf, 3,928,120.

Jakimowicz, Christopher C., to National Steel Corporation. Pollutants collection system for coke oven discharge operation. 3,928,144, Cl. 202-263.000.

Jakobsen, William J., to Lourdes Industries, Inc. Manifold system for renewing cable pressure and valve arrangement therefor. 3,928,711, Cl. 174-11.00R.

James B. Carter Limited: *See—*
Lancaster, Arthur, 3,927,731.

James, John P., to Phillips Petroleum Company. Increased production of diesel oil and fuel oil. 3,928,173, Cl. 208-78.000.

Janaer Glaswerk Schott & Gen.: *See—*
Neuroth, Norbert, 3,928,229.

Jancis, Elmar H.: *See—*
Hubbard, Winchester L.; Grahame, Robert E., Jr.; Covey, Rupert A.; and Jancis, Elmar H., 3,928,617.

Janssen Pharmaceutica N.V.: *See—*
Heeres, Jan; Mostmans, Joseph Hector; and Maes, Robert, 3,928,374.

Janssens, Wilhelmus: *See—*
Poot, Albert Lucien; Heugebaert, Frans Clement; Janssens, Wilhelmus; and Vandenberghe, Antoon Leon, 3,928,686.

Japan Asbestos Co., Ltd.: *See—*
Otouma, Takashi; Aoki, Susumu; Minaki, Toshihiro; Shibata, Kenichi; and Mori, Kentaro, 3,928,049.

Japan Gasoline Co., Ltd.: *See—*
Morikawa, Kiyoshi; Furuta, Akio; and Matsumoto, Hideyuki, 3,928,002.

Japan Tobacco and Salt Public Corporation, The: *See—*
Matsuyama, Susumu; Hirabayashi, Seishiro; Iida, Bunkichi; and Miki, Hajime, 3,927,682.

Jasinski, John, to Owens-Illinois, Inc. Colored glass compositions. 3,928,050, Cl. 106-52.000.

Jeffery, Thomas C.: *See—*
Rahn, Henry W.; Cunningham, Hugh; Dilmore, Colonel R.; Jeffery, Thomas C.; and Raetzsch, Carl W., 3,928,150.

Jellinck, Karl; and Oellig, Rudi, to Rutgerswerke Aktiengesellschaft. Composition containing unsaturated monomers and polymerizable by ionizing radiation. 3,928,287, Cl. 260-47.0CB.

Jeng, Shien Tsai: *See—*
Hanado, Masanao; Takamoku, Kensi; Miyoshi, Tsutomu; and Jeng, Shien Tsai, 3,927,726.

Jenkins, Ian; Moffatt, John G.; and Verheyden, Julien P. H., to Syntex (U.S.A.) Inc. 4 -Fluoro nucleosides, novel intermediates and methods of preparing same. 3,928,319, Cl. 260-211.50R.

Jennings, Gene A.; Streitferdt, John J.; and Suverison, Lyle B., to General Motors Corporation. Battery cable with detachably retained connector. 3,928,079, Cl. 136-135.00S.

Jensen, Garold K., to United States of America, Navy. Object locator system. 3,928,851, Cl. 343-9.000.

Jet Spray Cooler, Inc.: *See—*
Lavochkin, Ronald B.; and Gardner, John, 3,927,802.

Jette, Emile; and Guldin, Maxwell. Adjustable bathtub overflow liquid control. 3,927,428, Cl. 4-206.000.

Jidosha Denki Kogyo Kabushika Kaisha: *See—*
Inoue, Naohiko; and Moori, Youichi, 3,927,436.

Jidosha Kiki Co., Ltd: *See—*
Masuda, Naosuke, 3,927,916.

Jin, Katsuyuki: *See—*
Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, 3,928,728.

Joan of Arc Company: *See—*
Sammet, Aaron F., 3,927,514.

Jobst, Wolfgang, to General Motors Corporation. Defroster outlet. 3,927,607, Cl. 98-2.090.

Johannsen, Rolf, to Intermercury Finance and Trading Co., Ltd. Installation channel. 3,927,698, Cl. 138-162.000.

Johansson, Bjorn-Olow; and Palm, Bengt Arne, to Alfa-Laval AB. Method for sterilizing liquids. 3,927,974, Cl. 21-56.000.

Johns Hopkins University, The: *See—*
Hill, Maynard L., 3,928,801.

Johnson, Aaron C., to Weekley, Alfred E.; Hatfield, John; and Jones, Floyd, part interest to each. Traction system. 3,927,745, Cl. 192-49.000.

Johnson, Bruce K.: *See—*
Ivester, Andrew S.; and Johnson, Bruce K., 3,928,862.

Johnson, Clifford E.: *See—*
Hyler, John H.; and Johnson, Clifford E., 3,927,759.

Johnson, Ferris L. Car top carrier for boats and the like. 3,927,779, Cl. 214-450.000.

Johnson, Gordon B.: *See—*
Chill, Leonard; Johnson, Gordon B.; and Weisner, Carl S., 3,927,957.

Johnson & Johnson: *See—*
Drelich, Arthur H.; and Lukacs, George J., 3,928,676.

Johnson, Marvin M.: *See—*
Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., 3,928,389.

Johnson, Rodney L.: *See—*
Zinsmeyer, Herbert G.; Johnson, Rodney L.; Genz, Ralph H.; and Setliff, James E., 3,927,800.

Johnson, Thomas Albert, to Du Pont de Nemours, E. I., and Company. Chlorination of xylene. 3,928,478, Cl. 260-651.00R.

Johnston, Clyde P., to Minnesota Mining and Manufacturing Company. High-pressure valve. 3,927,693, Cl. 137-625.470.

Jones, Floyd: *See—*
Johnson, Aaron C., 3,927,745.

Jones, George D. Foldable step. 3,927,903, Cl. 280-166.000.

Jones, Herbert; and Dorn, Michael Thomas, to Simon-Barron Limited. Pelletizing machines. 3,927,448, Cl. 29-116.00R.

Jones, Herman W. Ventilation systems. 3,927,828, Cl. 236-49.000.

Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., to Armour Pharmaceutical Company. Zirconium complexes of basic aluminum chlorides and methods of making same. 3,928,545, Cl. 423-463.000.

Jones, Robert N., to Xerox Corporation. Flexible xerographic photoreceptor element. 3,928,036, Cl. 96-1.500.

Jones, Robert W.: *See—*
Gordon, Robert E.; Jones, Robert W.; Paul, Rajendra; and Simon, Robert H. M., 3,927,983.

Jones, Roger W.; Fineman, J. C.; and Roesser, James R., to American Institute of Physics. Keyboard and encoding system for photocomposition of scientific text including multiline mathematical equations. 3,927,752, Cl. 197-19.000.

Jones, Ronald E.: *See—*
Chen, Ting P.; and Jones, Ronald E., 3,928,447.

Jordan, Wesley A.; and Carter, Walter H., to General Mills Chemicals, Inc. Xanthomonas gum amine salts. 3,928,316, Cl. 260-209.00R.

Jouffret, Michel: *See—*
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Jouffret, Michel, 3,928,452.

Junck, John A.; and Latimer, Eugene E., to Caterpillar Tractor Co. Filter mounting and bypass valve assembly. 3,928,201, Cl. 210-132.000.

Jung, Gerd; and Bauer, Jakob, to Varta Batterie Aktiengesellschaft. Primary cell with negative electrode. 3,928,074, Cl. 136-100.00M.

Justrite Manufacturing Company: *See—*
Flider, Frank S., 3,927,797.

Juvet, Claude-Michel, to Seitz S.A. Pin guide for printing head. 3,927,751, Cl. 197-1.00R.

Kabushiki Kaisha Aichidenkikosakusho: *See—*
Yamamoto, Osamu, 3,927,472.

Kabushiki Kaisha Hattori Tokeiten: *See—*
Kitai, Kiyoshi, 3,928,861.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Dycke, Norbert; and Sakai, Hiroshi, 3,927,549.

Kabushiki Kaisha Osaka Packing Seizosho: *See—*
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Kabushiki Kaisha Shimizu Manzo Shoten: *See—*
Sugiyama, Noboru; and Shimahara, Hideo, 3,928,322.

Kabushiki Kaisha Suwa Seikosha: *See—*
Harigaya, Hiroshi; Kanai, Masao; and Kano, Toshio, 3,928,095.
Yamamura, Katsumi; Harigaya, Hiroshi; and Sakai, Yasuo, 3,928,085.

Kabushiki Kaisha Tokyo Keiki: *See—*
Masuzawa, Isao; Awano, Tsuneo; and Onishi, Kazutoshi, 3,927,635.

Kaczmarek, Thomas D.: *See*—
Byrne, Francis P.; and Kaczmarek, Thomas D., 3,927,979.

Kafarov, Viktor Vyacheslavovich: *See*—
Soloviev, Vladimir Pavlovich; Kafarov, Viktor Vyacheslavovich; Schus, Alexandr Grigorievich; and Stulnikov, Gennady Pavlovich, 3,927,838.

Kaffenberger, Ernst; and Schuttloffel, Erich, to Licentia Patent-Verwaltungs-G.m.b.H. Waveguide transition piece with low reflection. 3,928,825, Cl. 333-34.000.

Kai, Kazuo. Telephone set with built-in loudspeaker. 3,928,723, Cl. 179-1.0FS.

Kaiser Aluminum & Chemical Corporation: *See*—
Panusch, Erwin; and Sobolev, Igor, 3,928,318.
Rigge, Ronald J.; and Carniglia, Stephen C., 3,928,236.
Slater, Jack D.; Latham, William G. H.; and Farrow, Robert H., 3,928,221.
Zinniger, Theodore C.; and Burke, Phillip J., 3,927,788.

Kaiser, Bernd-Ulrich: *See*—
Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, 3,928,265.

Kaiser Steel Corporation: *See*—
Claflin, Harry B., 3,928,023.

Kaiser, Willard D., to International Lead Zinc Research Organization, Inc. Capacitive displacement transducer. 3,928,796, Cl. 324-61.00R.

Kalninsh, Arvid Janovich: *See*—
Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 3,928,562.

Kamada, Sueo; Yamashita, Takeshi; Ide, Tohru; Ajiki, Ryogo; and Kitamura, Takao, to Asahi Kasei Kogyo Kabushiki Kaisha Process for hydrolyzing dicyan. 3,928,444, Cl. 260-561.00K.

Kamata, Yoshinori: *See*—
Sato, Masatoshi; Umemura, Katuo; and Kamata, Yoshinori, 3,927,767.

Kamath, Venkatesh: *See*—
Mookherjee, Braja Dulal; Kamath, Venkatesh; and Shuster, Edward J., 3,928,247.

Kamiya, Iwao: *See*—
Makino, Yoshimi; Okamoto, Tsutomu; and Kamiya, Iwao, 3,928,836.

Kanai, Masao: *See*—
Harigaya, Hiroshi; Kanai, Masao; and Kano, Toshio, 3,928,095.

Kanbara, Shigeo: *See*—
Matsubara, Kenji; and Kanbara, Shigeo, 3,928,021.

Kanebo, Ltd.: *See*—
Ida, Syunya; and Endo, Norio, 3,927,973.

Kaneko, Yasuhisa; Komiyama, Yoshiro; Kondo, Katsumi; Noda, Fumiyoshi; and Uchida, Kunihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Process for the production of metal containing ceramics. 3,928,662, Cl. 427-294.000.

Kaneko, Yasuhisa: *See*—
Niimi, Itaru; Kaneko, Yasuhisa; Morita, Akiyoshi; Nemoto, Yasuo; and Sato, Mitsuyoshi, 3,928,241.

Kaneta, Kyoichi: *See*—
Kitayama, Minoru; Taniguchi, Kasuyuki; Kaneta, Kyoichi; and Hirose, Kikuzi, 3,928,048.

Kang, Jung W.: *See*—
Lohr, Delmar F., Jr.; and Kang, Jung W., 3,928,282.

Kano, Toshio: *See*—
Harigaya, Hiroshi; Kanai, Masao; and Kano, Toshio, 3,928,095.

Kantor, Sidney: *See*—
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 3,928,382.

Kao Soap Co., Ltd.: *See*—
Hiyama, Osamu; and Ito, Kazuo, 3,928,275.
Matsuda, Kazuo; Ohmura, Hidemasa; and Aritaki, Hirakazu, 3,928,271.

Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Propynylamine-substituted dibenzo[b,f]thiepins and dibenz[b,f]oxepins. 3,928,383, Cl. 260-327.00B.

Kapolyi, Laszlo; Kubovits, Imre; Kaszanitzky, Ferenc; and Szabo, Tatabanyai Szenbanyak. Artificial stone and method for making the stone from a coal byproduct. 3,928,047, Cl. 106-39.600.

Karadavidoff, Isaac: *See*—
Moreau, Michele; Karadavidoff, Isaac; and Risse, Claude, 3,928,603.

Karchmar, Arthur; and Nejelski, Leo Lawrence, Jr., to International Telephone and Telegraph Corporation. Preservatives for photographic developers. 3,928,042, Cl. 96-66.400.

Karrer, Friedrich Wilhelm Johann; and Mellgren, Per Gustaf, to Karrer System AG. Method and apparatus for drying fibrous material. 3,927,478, Cl. 34-20.000.

Karrer System AG: *See*—
Karrer, Friedrich Wilhelm Johann; and Mellgren, Per Gustaf, 3,927,478.

Kasai, Toshiyuki, to Nippon Kogaku K.K. Polarization analyser device. 3,927,947, Cl. 356-117.000.

Kashiyama, Hiroshi; and Tobita, Susumu, to Furukawa Electric Co., Ltd., The. Method for forming on an elongated core member a covering of thermoplastic material by extrusion. 3,928,519, Cl. 264-40.000.

Kashkina, Nadezhda Alexandrovna: *See*—
Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 3,928,562.

Kaszanitzky, Ferenc: *See*—
Kapolyi, Laszlo; Kubovits, Imre; Kaszanitzky, Ferenc; and Szabo, 3,928,047.

Kato, Katsuhiro; Suzuki, Hideo; and Yano, Norio, to Nippon Telegraph and Telephone Public Corporation. Crosspoint elements and electromagnetic coordinate selection devices utilizing the same. 3,928,828, Cl. 335-112.000.

Kato, Yasuo: *See*—
Masai, Yukito; Kato, Yasuo; Murayama, Ken; and Fukui, Nobuhiko, 3,928,283.

Katsuragawa Denki Kabushiki Kaisha: *See*—
Kinoshita, Koichi, 3,928,031.

Katsuta, Kihei; Matsumoto, Tsutomu; and Matsuyama, Chiaki, to Mitsubishi Jukogyo Kabushiki Kaisha. Hatch construction in a low temperature liquid tank. 3,927,787, Cl. 220-9.0LG.

Katunuma, Nobuhiko, to Chugai Seiyaku Kabushiki Kaisha. Amplifying factor of cortisone induction and process of the production thereof. 3,928,568, Cl. 424-115.000.

Katz, Saul N., to General Foods Corporation. Coffee extraction process. 3,928,636, Cl. 426-434.000.

Katzakian, Arthur, Jr.; and Depree, David O., to Aerojet-General Corporation. Buffered, weak ion-exchange water demineralization process. 3,928,192, Cl. 210-30.000.

Katzer, Ernst; and Baronnet, Pierre, to Knorr-Bremse GmbH. Device for mounting rail-brake magnets. 3,927,739, Cl. 188-206.00R.

Kauffman, William J., to Armstrong Cork Company. Isocyanurate compounds and processes for preparing same. 3,928,343, Cl. 260-248.0NS.

Kavchok, Ronald W., to Goodyear Tire & Rubber Company, The. Stabilization of vinylidene chloride/diene copolymers. 3,928,296, Cl. 260-80.730.

Kawai, Hisasi; and Iwase, Kazuo, to Nippon Soken, Inc. Electronic ignition timing control circuit for internal combustion engine. 3,927,648, Cl. 123-117.00R.

Kawamura, Kiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. After-control signal detecting sensor for keyboard of electronic musical instrument. 3,927,593, Cl. 84-1.010.

Kawamura, Sadao; Hayakawa, Akira; and Kurokawa, Harutoshi, to Toray Industries, Inc. Process for treating fibrous articles with an aqueous treating liquid. 3,927,972, Cl. 8-155.200.

Kawanabe, Shinya: *See*—
Yamaguchi, Yoshiharu; and Kawanabe, Shinya, 3,928,698.

Kawasaki, Kouichi: *See*—
Gondo, Hisashi; Takechi, Hiroshi; Namba, Kazuo; Usuda, Matsuo; and Kawasaki, Kouichi, 3,928,083.

Kawasaki Steel Corporation: *See*—
Harada, Shunichi; and Abe, Hideo, 3,927,460.

Kawase, Shoji: *See*—
Inata, Hiroo; Kawase, Shoji; and Shima, Takeo, 3,928,279.

Kawatetsu Metrological Equipment and Vending Machine Company, Ltd.: *See*—
Tsunoda, Tatsui; Oka, Santaro; Miyamoto, Kazuma; Matsumoto, Makoto; and Baba, Heiji, 3,928,045.

Kayano, Tatsuo: *See*—
Watatani, Yoshizumi; Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, 3,928,720.

Keesey, Dennis Lee: *See*—
Gibble, Lawrence W.; and Keesey, Dennis Lee, 3,927,449.

Keithley, Joseph F., to United States of America, Navy. Pressure-time responsive electronic device. 3,927,615, Cl. 102-18.000.

Keller, Roger W.: *See*—
Ramaker, Dudley D.; and Keller, Roger W., 3,927,513.

Kelley, James O., to Herman Miller Inc. Panel joining and work surface support apparatus. 3,927,924, Cl. 312-263.000.

Kelmik, Inc.: *See*—
Hoeltgen, James B.; and Humphrey, Harold E. B., 3,928,195.

Kendall Company, The: *See*—
Samour, Carlos M.; and Richards, Mildred C., 3,928,423.

Kendrick, Gary R.: *See*—
Sauder, Robert A.; and Kendrick, Gary R., 3,928,097.

Kenematic Company Inc.: *See*—
Emkjer, Erwin J.; and Tucker, L. Kenneth, 3,927,589.

Kennecott Copper Corporation: *See*—
Harvey, Walter W.; Randlett, Myron R.; and Bangerskis, Karlis I., 3,928,152.

Kennedy, James Blakely, to Bell Telephone Laboratories, Incorporated. Trunk make-busy circuit. 3,928,735, Cl. 179-175.30R.

Kennedy, Joseph P.: *See*—
Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., 3,928,297.

Kenrick, Robert C.: *See*—
Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., 3,927,885.

Kent Instruments Limited: *See*—
Zanker, Klaus Joachim, 3,927,566.

Kepka, Jiri; Kovarik, Karel; Loun, Bohuslav; and Zeleny, Jaromir, to Vyzkumny ustav obrabecich stroju a obrabeni. Device for the photoelectric marking and reading of tools for NC machine tools. 3,928,827, Cl. 235-61.11E.

Kerley, Robert V., to Ethyl Corporation. Coal combustion process and composition. 3,927,992, Cl. 44-4.000.

Kersavage, Joseph A. Method for constructing a tensile-stress structure and resultant structures. 3,927,496, Cl. 52-80.000.

Kerst, Al F.: *See—*
Douros, John D., Jr.; and Kerst, Al F., 3,928,017.

Kerwin, Daniel, to Meyercord Co., The. Machine for transferring indicia to cylindrical articles. 3,928,115, Cl. 156-363.000.

Ketelsen, Broder, to Fischer & Porter Co. Vortex type flowmeter. 3,927,564, Cl. 73-194.00B.

Khayat, Ali; Courtney, George W.; and Dunn, Howard J., to Ralston Purina Company. Method of treatment of animal flesh. 3,928,637, Cl. 426-437.000.

Khentigan, Archie S.: *See—*
Winchell, Harry S.; Khentigan, Archie S.; and Lin, Hong, 3,928,552.

Kiencke, Uwe; and Honig, Gunter, to Robert Bosch G.m.b.H. Circuit for converting a frequency into a binary number. 3,928,797, Cl. 324-78.00D.

Kierstead, Richard Wightman; LeMahieu, Ronald Andrew; and Pruess, David, to Hoffmann-La Roche Inc. Antibiotic 1745A/X and methods for the production thereof. 3,928,387, Cl. 260-343.000.

Kiess, Tilman: *See—*
van der Kolk, Hans-Jurgen; Mindner, Reinhard; Kiess, Tilman; Muhlich, Peter; Aldinger, Ulrich; and Adler, Karl-Heinz, 3,927,528.

Kihara, Nobuyoshi: *See—*
Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; and Kihara, Nobuyoshi, 3,928,719.

Kikuchi, Tomio: *See—*
Arai, Kiyoyuki; and Kikuchi, Tomio, 3,928,846.

Kim, Choong-Ki: *See—*
Anthony, Michael P.; Gunsagar, Kamleshwar; Kim, Choong-Ki; and Walsh, Lloyd R., 3,927,468.

Kimmel, Ray D. Gun rack. 3,927,923, Cl. 312-252.000.

Kimoto, Hisashi, to Murata Kikai Kabushiki Kaisha. Twister device for producing crimped filamentary yarns. 3,927,517, Cl. 57-77.450.

King, William H., Jr.; and Varga, Gideon M., Jr., to Exxon Research and Engineering Company. Method for cleaning a crystal microbalance. 3,928,063, Cl. 134-1.000.

Kingsford-Smith, Charles A., to Hewlett-Packard Company. Device for synthesizing frequencies which are rational multiples of a fundamental frequency. 3,928,813, Cl. 331-1.00A.

Kinney, David W.; and Baxter, William E., to Union Insulating Company. Electrical wiring box structure. 3,927,785, Cl. 220-3.800.

Kinoshita, Koichi, to Katsuragawa Denki Kabushiki Kaisha. Method of electrophotography. 3,928,031, Cl. 96-1.00R.

Kirby, Jane Parsons; Borders, Donald Bruce; and Korshalla, Jean Hayes, to American Cyanamid Company. Antibiotic BM408α. 3,928,317, Cl. 260-210.0AB.

Kirby, Robert F., to Garrett Corporation, The. Cooled turbine components and method of making the same. 3,927,952, Cl. 416-95.000.

Kircher, Dieter: *See—*
Fink, Werner; and Kircher, Dieter, 3,927,914.

Kirchner, Paul: *See—*
Zwarg, Gunter; and Kirchner, Paul, 3,928,779.

Kirk, Bradley S.; and Chappel, Raymond M., to Airco, Inc. Gas absorption system and method. 3,928,199, Cl. 210-63.000.

Kirsch Company: *See—*
Ford, James A., 3,927,437.

Kirsch, Reinhard: *See—*
Duwel, Dieter; Kirsch, Reinhard; Loewe, Heinz; and Urbanietz, Josef, 3,928,375.
Rochling, Hans; Hartel, Kurt; and Kirsch, Reinhard, 3,928,345.

Kishi, Noboru; Ota, Yoshitaka; and Okuno, Nobuyoshi, to Mitsubishi Chemical Industries Ltd. Anthraquinone dyestuffs. 3,928,396, Cl. 260-380.000.

Kishino, Takahiro: *See—*
Takayama, Yuzi; Ichimura, Yutaka; Aoyagi, Takanobu; and Kishino, Takahiro, 3,928,254.

Kishiwada, Susumu: *See—*
Shiraishi, Tatsuo; Kishiwada, Susumu; Shimizu, Shinkichi; Honmaru, Shigeru; Ichihashi, Hiroshi; and Nagaoka, Yoshihiko, 3,928,462.

Kitahara, Hitoshi; and Pei, Jack C., to Fuji Xerox Co., Ltd. Manuscript scanning device for copying machines and the like. 3,927,940, Cl. 355-66.000.

Kitai, Kiyoshi, to Kabushiki Kaisha Hattori Tokeiten. Electronic circuit indicating light level and controlling exposure of camera. 3,928,861, Cl. 354-60.00L.

Kitamoto, Tatsuji: *See—*
Tadokoro, Eiichi; and Kitamoto, Tatsuji, 3,928,159.

Kitamura, Takao: *See—*
Kamada, Suco; Yamashita, Takeshi; Ide, Tohru; Ajiki, Ryogo; and Kitamura, Takao, 3,928,444.

Kitayama, Minoru; Taniguchi, Kasuyuki; Kaneta, Kyoichi; and Hirose, Kikuzi, to Nippon Steel Corporation. Enamel glaze composition. 3,928,048, Cl. 106-48.000.

Kivett, William D.; Champion, Robert J.; and Harris, Jesse P. T., to Engineering Development Associates, Incorporated. Small object counting apparatus. 3,928,753, Cl. 235-92.0PK.

Klein, Jack, to S.S.B. Industries, Inc. Lock securing assembly. 3,927,544, Cl. 70-416.000.

Klein, Richard W., Sr. Film cartridge carrier. 3,927,809, Cl. 224-5.00R.

Kleinhagauer, Otmar, to Gebr. Bohler & Co. AG. Fluid-cooled mold. 3,927,855, Cl. 249-79.000.

Kleiss, Joachim: *See—*
Brachert, Heinrich; Girke, Dieter; and Kleiss, Joachim, 3,928,514.

Klicker, James D.; and Cohen, Murray S., to Borg-Warner Corporation. Dipentaerythritol and pentaerythritol phosphite. 3,928,505, Cl. 260-921.000.

Klingberg, Anders William: *See—*
Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erik, 3,928,061.

Klint, Robert V.: *See—*
Godwin, Stanley J.; and Klint, Robert V., 3,927,555.

Kluepfel, Dieter; Kudelski, Alicia; and Bagli, Jehan, to Ayerst Mckenna and Harrison Ltd. Myriocin and process of preparation. 3,928,572, Cl. 424-122.000.

Klug, Helmut: *See—*
Hambsch, Erich; Klug, Helmut; Ortner, Herbert; Semmlinger, Walter; and Wirtz, Rudolf, 3,928,503.

Knavish, Leonard A., to PPG Industries, Inc. Method for producing flat glass. 3,928,014, Cl. 65-136.000.

Knelson, Harry. Pulp sheet gripping tool. 3,927,908, Cl. 294-19.00R.

Knight, Rodney A.; Zang, Joseph A.; and Slanski, John, to AMF Incorporated. Quench bath regeneration system for microporous film production. 3,928,517, Cl. 264-38.000.

Knorr-Bremse GmbH: *See—*
Falke, Erich, 3,927,917.
Katzer, Ernst; and Baronnet, Pierre, 3,927,739.

Knudsen, Christian W.; and von Rosenberg, Hermann E., to Exxon Research and Engineering Company. Coal injection system. 3,927,996, Cl. 48 197.00R.

Knudson, Richard A. Reinforced panels and method of constructing same. 3,928,691, Cl. 428-53.000.

Kobayashi, Akira: *See—*
Yokota, Hisao; Kobayashi, Akira; Horikawa, Jiro; and Miyashita, Akira, 3,928,544.

Kobayashi, Kazuhiro; Saito, Hiroshi; Ogawa, Yukio; Yoshida, Koki; and Kondo, Isamu, to Hitachi, Ltd. Apparatus for producing laminated magnetic cores for inductive electric apparatus. 3,927,454, Cl. 29-203.00L.

Kobayashi, Takuichi: *See—*
Takeda, Hiromu; Kobayashi, Takuichi; Oka, Koichiro; and Tanaka, Kazumi, 3,928,496.

Kobayashi, Toshiharu: *See—*
Hanai, Ichiro; Takahashi, Kazuo; and Kobayashi, Toshiharu, 3,928,747.

Koberstein, Edgar; and Lakatos, Eduard, to Deutsche Gold-und Silber-Scheideanstalt vormals Roessler. Exhaust gas purifying catalyst and process of making and using same. 3,928,238, Cl. 252-465.000.

Koberstein, Edgar; and Lakatos, Eduard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Catalyst useful at higher temperatures, especially for purification of exhaust gases from motor vehicles and industrial plants. 3,928,534, Cl. 423-213.200.

Kochurova, Alexandra Ivanovna; Korobkina, Zoya Vasilievna; and Mikhailova, Tatiana Nikolaevna. Preparation for preserving vegetable food products particularly fruits. 3,928,577, Cl. 424-164.000.

Kodama, Kenji: *See—*
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; Yaguchi, Kunihide; Kodama, Kenji; and Miyamori, Tamotsu, 3,928,537.

Kochler-Dayton, Inc.: *See—*
Delaney, R. Edward; and Cornish, Alan H., 3,927,425.

Koehring Company: *See—*
Bernhoft, Gerald W., 3,927,603.

Koelewijn, Pieternella, to Shell Oil Company. Dyeable polypropylene compositions containing a polyamine adduct. 3,928,504, Cl. 260-897.00B.

Koenig, Nathan H.; and Friedman, Mendel, to United States of America, Agriculture. Insectproofing wool with zinc acetate. 3,927,969, Cl. 8-128.00R.

Kohn, Gustave K.: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., 3,928,407.

Kohn, Gustave K., administrator: *See—*
Brown, Melancthon S., deceased; and Kohn, Gustave K., 3,928,407.

Kolarik, Jan: *See—*
Heidingsfeld, Viktor; Hudecek, Slavko; Hnidek, Jaroslav; Kolarik, Jan; and Zelinger, Jiri, 3,928,704.

Kollmar, Walter; Markl, Hans; and Thieme, Klaus, to Siemens Aktiengesellschaft. Method for erecting and operating at least two nuclear reactors. 3,928,128, Cl. 176-30.000.

Kolodziej, Alojzy Antoni, to Ronson Products Limited. Method for manufacturing dry shaver-cutter unit. 3,927,581, Cl. 76-104.00R.

Komatsuzaki, Shigeki: *See—*
Naka, Reishi; Komatsuzaki, Shigeki; Tomobe, Tomotsuna; and Moniwa, Yoshihiro, deceased, 3,928,214.

Komiyama, Yoshiro: *See—*
Kaneko, Yasuhisa; Komiyama, Yoshiro; Kondo, Katsumi; Noda, Fumiyoshi; and Uchida, Kunihiko, 3,928,662.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Hakansson, Sven Anders Samuel, 3,927,529.

Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, to Canon Kabushiki Kaisha. Blade type cleaning device in an electrophotographic copying machine of the image transfer type. 3,927,936, Cl. 355-15.000.

Kondo, Isamu: *See*—
Kobayashi, Kazuhiro; Saito, Hiroshi; Ogawa, Yukio; Yoshida, Koki; and Kondo, Isamu, 3,927,454.

Kondo, Katsumi: *See*—
Kaneko, Yasuhisa; Komiyama, Yoshiro; Kondo, Katsumi; Noda, Fumiyoshi; and Uchida, Kunihiko, 3,928,662.

Konishi, Kenzo; Kotone, Akira; Nakane, Yoshihiko; Hori, Takeshi; and Hoda, Masahiro, to Sakai-Chemical Industry Company, Ltd. Trisazo compounds containing a diphenylheterocyclic component. 3,928,310, Cl. 260-152.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Endo, Takaya; Satoh, Ryosuke; Masukawa, Toyoaki; and Uozumi, Takahiro, 3,928,041.

Konno, Koji: *See*—
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; Yaguchi, Kunihide; Kodama, Kenji; and Miyamori, Tamotsu, 3,928,537.

Konno, Tsutomu: *See*—
Takahashi, Ryoichi; Hosoi, Takuji; Aiba, Takaaki; and Konno, Tsutomu, 3,928,170.

Konomi, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Flow rate measuring system with calibration means. 3,927,563, Cl. 73-205.00D.

Koo, Ronald C., to Duro-Test Corporation. Tungsten alloy filaments for lamps and method of making. 3,927,989, Cl. 29-182.500.

Kopacki, Adam F.: *See*—
Kraft, Paul; Kopacki, Adam F.; and Brunner, Robert, 3,928,500.

Koppers Company, Inc.: *See*—
Mruk, Norbert J., 3,928,430.

Korner, Tassilo: *See*—
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 3,927,697.

Korobkina, Zoya Vasilievna: *See*—
Kochurova, Alexandra Ivanovna; Korobkina, Zoya Vasilievna; and Mikhailova, Tatiana Nikolaevna, 3,928,577.

Korshalla, Jean Hayes: *See*—
Kirby, Jane Parsons; Borders, Donald Bruce; and Korshalla, Jean Hayes, 3,928,317.

Kosmiderski, Szymon; and Polak, Slaw, to Wojewodzka Stacja Krwiodawstwa. Process for the preparation of a serological carrier. 3,928,628, Cl. 424-366.000.

Kosswig, Kurt; and Meister, Herbert, to Chemische Werke Huls Aktiengesellschaft. Washing composition containing suds suppressing agents. 3,928,250, Cl. 252-542.000.

Kosted, Phillip W.: *See*—
Shepard, John C., Jr.; Wight, Robert C.; and Kosted, Phillip W., 3,928,164.

Kotera, Hiroaki: *See*—
Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; and Kihara, Nobuyoshi, 3,928,719.

Kotera, Norio: *See*—
Suda, Hideaki; Kotera, Norio; and Hasegawa, Shinichi, 3,928,471.

Kothe, Hans-Kurt; and Schneider, Rudi, to Varta Batterie Aktiengesellschaft. Automatically activated battery assembly. 3,928,078, Cl. 136-114.000.

Kotone, Akira: *See*—
Konishi, Kenzo; Kotone, Akira; Nakane, Yoshihiko; Hori, Takeshi; and Hoda, Masahiro, 3,928,310.

Kotow, Stephen S.: *See*—
Bolsenga, Stanley J.; Kotow, Stephen S.; Reuter, Henry G.; and Volante, Donald J., 3,927,878.

Kovalenko, Gerald E.; and Woods, Charles E., to United States of America, Navy. Fluidic analog ring position device. 3,927,849, Cl. 244-3.220.

Kovarik, Karel: *See*—
Kepka, Jiri; Kovarik, Karel; Loun, Bohuslav; and Zeleny, Jaromir, 3,928,827.

Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased (by Stoll, Suzanne, executrix), to Firmenich S.A. Cycloaliphatic unsaturated ketones as odour- and taste-modifying agents. 3,928,456, Cl. 260-586.00R.

Kowalski, Xavier, to Monsanto Company. Method for electroplating. 3,928,147, Cl. 204-29.000.

Koyama, Hiroaki, to Nippon Kynol Inc. Process for producing cured phenolic continuous filaments. 3,928,526, Cl. 264-236.000.

Kozacka, Frederick J.: *See*—
Salzer, Erwin; and Kozacka, Frederick J., 3,927,927.

Kraft, Kurt: *See*—
Reese, Johannes; and Kraft, Kurt, 3,928,376.

Kraft, Paul; Kopacki, Adam F.; and Brunner, Robert, to Stauffer Chemical Company. Processing aid for polyvinyl chloride. 3,928,500, Cl. 260-884.000.

Krah, Robert: *See*—
Heuschen, Alexander; Schaefer, Hans; Budich, Wolfgang; Krah, Robert; and Obermeier, Karl, 3,928,100.

Krauss-Maffei Aktiengesellschaft: *See*—
Hanslik, Wilhelm, 3,927,869.

Krekeler, Hans: *See*—
Riemenschneider, Wilhelm; Hornig, Lothar Heinz, deceased; Hornig nee Munich, Anncliese, co-heiress; Meidert, Helmut; and Krekeler, Hans, 3,928,479.

Kremer, Richard D., to Schleicher & Schuell, Incorporated. Chromatographic apparatus. 3,928,203, Cl. 210-198.00C.

Kresge, James S.: *See*—
Fishman, Herbert; and Kresge, James S., 3,928,245.

Krikorian, Oscar H., to United States of America, Energy Research and Development Administration. Thermochemical production of hydrogen. 3,928,549, Cl. 423-648.000.

Krishnan, Ram Murthy, to Goodyear Tire & Rubber Company, The. Method of preparing p-chlorophenylenediamine. 3,928,451, Cl. 260-580.000.

Kroczynski, Jozef: *See*—
Sledzinski, Bohdan; Kroczynski, Jozef; Zwierzak, Andrzej; Cieslak, Ludwika; and Majda, Aleksander, 3,928,586.

Kubinek, Milan: *See*—
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 3,927,450.

Kubo, Kazuhiko, to Kabushiki Kaisha Osaka Packing Seizosho. Products of wollastonite crystals and manufacturing the same. 3,928,054, Cl. 106-120.000.

Kubo, Mitsuyasu: *See*—
Sucmatsu, Yasuo; Miyazaki, Ryuhei; Kubo, Mitsuyasu; Uotani, Tsuyoshi; and Uchida, Hironori, 3,928,157.

Kubota, Hayato: *See*—
Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, 3,928,635.

Kubota, Kunihiro: *See*—
Yonehara, Kiyoshi; Kubota, Kunihiro; Ono, Tetsuji; and Ohara, Takashi, 3,928,239.

Kubovits, Imre: *See*—
Kapolyi, Laszlo; Kubovits, Imre; Kaszanitzky, Ferenc; and Szabo, , 3,928,047.

Kuchenmeister, Rolf: *See*—
Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, 3,928,265.

Kuchuris, George F.: *See*—
Yatsushiro, Kenji; Kuchuris, George F.; and Williqman, John, 3,928,831.

Kuck, Valerie Jeanne: *See*—
Chandross, Edwin Arthur; and Kuck, Valerie Jeanne, 3,928,683.

Kudelski, Alicia: *See*—
Kluepfel, Dieter; Kudelski, Alicia; and Bagli, Jehan, 3,928,572.

Kudza, Thomas M.; Schwyn, Raymond E.; and Berg, Morris, to General Motors Corporation. Thick film resistor paste containing tantalaglass. 3,928,243, Cl. 252-514.000.

Kuhar, Ludwig John, to Singer Company, The. Thread tensioner with improved yawn mechanism. 3,927,631, Cl. 112-254.000.

Kuhlmann, Bernard: *See*—
Wandel, Martin; Salamon, Manfred; Dornheim, Gotz Gotmar; and Kuhlmann, Bernard, 3,928,696.

Kuhns, Richard J., to Xerox Corposation. Bookbinder having rotatable clamping means. 3,928,118, Cl. 156-477.00B.

Kuki, Takeshi: *See*—
Ishikawa, Toshikatsu; Endo, Tei; Masuyama, Toshio; Uruma, Fumio; Morishita, Masutaka; and Kuki, Takeshi, 3,927,986.

Kuraray Co. Ltd.: *See*—
Ashikaga, Tadao; Ohmori, Akio; and Ando, Masasi, 3,728,261.
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 3,928,403.

Kurcha Kagaku Kogyo Kabushiki Kaisha: *See*—
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; Yaguchi, Kunihide; Kodama, Kenji; and Miyamori, Tamotsu, 3,928,537.
Takahashi, Ryoichi; Hosoi, Takuji; Aiba, Takaaki; and Konno, Tsutomu, 3,928,170.

Kurokawa, Harutoshi: *See*—
Kawamura, Sadao; Hayakawa, Akira; and Kurokawa, Harutoshi, 3,927,972.

Kusters, Norbert L.; and MacMartin, Malcolm P., to Canadian Patents and Development Limited. Automatic balancing DC comparator voltmeter. 3,928,799, Cl. 324-99.00D.

Kuwabara, Motosuke: *See*—
Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, 3,928,728.

Kuzmin, Sergei Vladimirovich: *See*—
Seleznev, Jury Emelyanovich; Burkin, Jury Alexandrovich; and Kuzmin, Sergei Vladimirovich, 3,927,455.

Kuzminsky, Alexandr Samoilovich: *See*—
Berlin, Alfred Anisimovich; Aseeva, Roza Mikhailovna; Mezhikovsky, Semen Markovich; Sherle, Alla Ilinichna; Tsepalova, Nadezhda Alexeevna; Goldovsky, Evgeny Alexandrovich; Zelenetskaya, Tatiana Vladimirovna; Fatkulina, Rozalia Komalovna; and Kuzminsky, Alexandr Samoilovich, 3,928,489.

Kyburz, Emilio: *See*—
Kaplan, Jean-Pierre; and Kyburz, Emilio, 3,928,383.

Kyogoku, Kazuaki; Hatayama, Katsuo; Yokomori, Sadakazu; and Seki, Teruya, to Taisho Pharmaceutical Co., Ltd. Anti-gastric ulcer chalcone ethers. 3,928,421, Cl. 260-479.00R.

Kyselica, Stanislav: *See*—
Sommer, Karel; Zdrazil, Jiri; Kubinek, Milan; Bahna, Jarolim; Kyselica, Stanislav; Habrovec, Frantisek; and Skarek, Jiri, 3,927,450.

La Bonvarite: *See*—
Langagne, Henri, 3,928,022.

La Cellophane: *See*—
Quang, Pham Kim, 3,928,032.

Labat, Yves; Mordelet, Yvon; and Signouret, Jean Baptiste, to Entreprise de Recherches et d'Activites Petrolieres (ELF). Lubricating compositions. 3,928,217, Cl. 252-45.000.

Labaz: *See*—
Descamps, Marcel; and Van Durme, Etienne, 3,928,384.

Lacefield, William B.; and Marshall, Winston S., to Eli Lilly and Company. Arylacetylene compounds as antithrombotic agents. 3,928,604, Cl. 424-353.000.

Laderach, Hans Rudolf, to Micarna AG Fleischwarenfabrik. Aseptic slicing machine for food products, and method. 3,927,588, Cl. 83-15.000.

Ladouceur, Harold A.; and Steward, John H., to Multifastener Corporation. Method of forming a nut and panel assembly. 3,927,465, Cl. 29-509.000.

Ladouceur, Harold A.: *See—*
Pouch, Thomas M.; and Ladouceur, Harold A., 3,927,452.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Demars, Paul; Cuny, Francis; Garrigoux, Joseph; and Tassart, Christian, 3,928,745.

Laitram Corporation, The: *See—*
Lapeyre, James M.; and Fowler, John T., 3,927,474.

Lakatos, Eduard: *See—*
Koberstein, Edgar; and Lakatos, Eduard, 3,928,238.
Koberstein, Edgar; and Lakatos, Eduard, 3,928,534.

Lam, Peter W. H., to Hodgson, R. W. Hair-grooming implement. 3,927,684, Cl. 132-11.00R.

Lampe, Wolfgang: *See—*
Hedvall, Per; Lampe, Wolfgang; and Spicar, Erich, 3,927,570.

Lancaster, Arthur, to James B. Carter Limited. Muffler with spiral duct and double inlets. 3,927,731, Cl. 181-58.000.

Lancini, Giancarlo; and Thiry, Lise, to Gruppo Lepetit S.p.A. Antiviral compositions containing piperazine derivatives and method of use. 3,928,593, Cl. 424-250.000.

Land, Edwin H., to Polaroid Corporation. Method of preparing diffusion transfer receiving sheets. 3,928,665, Cl. 427-339.000.

Landis, Abraham L.: *See—*
Bilow, Norman; Boschan, Robert H.; and Landis, Abraham L., 3,928,450.

Lang, Franz Josef, to Display-Design GmbH fur moderne Verkaufsforderungsmittel und Raumausstattung. Set of parts for a display rack. 3,927,625, Cl. 108-91.000.

Lang, Joseph; Meckenstock, Helmut; and Nopper, Hans-Joachim, to Flachglas Aktiengesellschaft Delog-Detag. Method of treating the corners of planar polygonal workpieces. 3,927,819, Cl. 228-212.000.

Langagne, Henri, to La Bonvarite. Method of producing ferrous metal of constant properties from heterogeneous mixtures. 3,928,022, Cl. 75-51.000.

Langbein, Adolf: *See—*
Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, 3,928,359.

Lange, Harold Carl: *See—*
Mac Leay, Ronald Edward; Lange, Harold Carl; and Sheppard, Chester Stephen, 3,928,493.

Langen & Co.: *See—*
Strauff, Gunther, 3,927,602.

Langen, Hanno, to Swiss Aluminum Ltd. Tamper proof seal for a container. 3,927,793, Cl. 220-266.000.

Langhorst, Fred E., to General Motors Corporation. Bumper test device. 3,927,554, Cl. 73-11.000.

Lannin, William W., to Stanray Corporation. Apparatus for forming arched roof sheets for automotive carrier vehicle. 3,927,548, Cl. 72-321.000.

Lanter, Kent J., to Ralston Purina Company. Method of preparing a fish product. 3,928,652, Cl. 426-643.000.

Lapeyre, James M.; and Fowler, John T., to Laitram Corporation, The. Internally gimballed compass. 3,927,474, Cl. 33-356.000.

Larbo, Stig: *See—*
Forsberg, Svante; Larbo, Stig; and Stephensen, Bjorn, 3,928,832.

Larker, Hans; and Nilsson, Jan, to Allmanna Svenska Elektriska Aktiebolaget. High pressure seal. 3,927,891, Cl. 277-190.000.

Larson, Lory E.; and Downs, Dallas I., to Southern California Edison Company. Water intake structure. 3,927,534, Cl. 61-17.000.

Lasas, Longinas, to United States Gypsum Company. Direct and acid dyes with the same dye chlorine decolored as leveller. 3,927,965, Cl. 8-89.000.

Laslo, Dennis J., to Fuller Company. Method and apparatus for treating gaseous pollutants in a gas stream. 3,928,005, Cl. 55-73.000.

Latham, Ralph A.: *See—*
Georgiade, Nicholas G.; and Latham, Ralph A., 3,927,664.

Latham, William G. H.: *See—*
Slater, Jack D.; Latham, William G. H.; and Farrow, Robert H., 3,928,221.

Latimer, Eugene E.: *See—*
Junck, John A.; and Latimer, Eugene E., 3,928,201.

Latuda, Frank A.: *See—*
Willner, Richard; Pauli, Jude A.; and Latuda, Frank A., 3,927,829.

Launey, Pierre A. Container for collection of cultures of parasitic fungi and a method of using the same. 3,928,136, Cl. 195-54.000.

Lauterbach, George E.; and Crill, Marla S., to Nalco Chemical Company. Paper coating lubricants and coated paper incorporating such. 3,928,707, Cl. 428-342.000.

Lavochkin, Ronald B.; and Gardner, John, to Jet Spray Cooler, Inc. Manual fill hot beverage dispenser. 3,927,802, Cl. 222-67.000.

Lawrence, John: *See—*
van Tongerloo, Eric Henry; Ibrahim, Abd-El-Fattah Ali; Colton, Douglas Roy; and Lawrence, John, 3,928,093.

Lawrence, John P., to Goodyear Tire & Rubber Company, The. N-[(Substituted amino) thio]-imides. 3,928,340, Cl. 260-247.10L.

Lazzarotti, S. James: *See—*
Wojtowicz, Edward A.; Lazzarotti, S. James; and Tartar, Paul E., 3,927,876.

Le Van Specialty Company, Inc.: *See—*
Carson, Lawrence E., 3,927,492.

Leberfinger, Rolf; and Matschkal, Heinz, to Schill & Seilacher. Process of producing a fatliquoring chrome tanning agent, composition containing same and method of using same. 3,927,966, Cl. 8-94.200.

Lechner, Robert, to Siemens Aktiengesellschaft. Contact tester. 3,928,795, Cl. 324-28.0CR.

Lederer, Louis Franklin, to Instrumentation Specialties Company. Sample collector. 3,927,701, Cl. 141-98.000.

Lee, Ho C.: *See—*
Helinski, Edward F.; Lee, Ho C.; and Zable, Jack L., 3,928,855.

Lee, John M.: *See—*
Beale, Alvin F., Jr.; and Lee, John M., 3,928,438.

Lee, Richard J., to Standard Oil Company. Polymeric-alkylphenolsulfonamides. 3,928,355, Cl. 260-268.0PL.

Lee, Wooyoung: *See—*
Davis, Francis E., Jr.; Graven, Richard G.; Lee, Wooyoung; and Sailor, Robert A., 3,928,172.

Leeming, Michael R. G.: *See—*
Greenspan, George; and Leeming, Michael R. G., 3,928,134.

Leeper, Robert W.; and Strohm, Paul, to Amchem Products, Inc. Plant growth regulant compositions and methods. 3,928,406, Cl. 260-448.80R.

Leisure Moments Incorporated: *See—*
Danon, Michael, 3,927,810.

LeMahieu, Ronald Andrew: *See—*
Kierstead, Richard Wightman; LeMahieu, Ronald Andrew; and Pruess, David, 3,928,387.

Lemelson, Jerome H.; and Elfman, Allan M. Integrally formed projectile and hook-like fasteners. 3,927,881, Cl. 273-58.00K.

Le Mieux, Robert W.: *See—*
Crossman, Phillip E.; Kenrick, Robert C.; and Le Mieux, Robert W., 3,927,885.

Lena, Louis: *See—*
Soula, Gerard; Metzger, Jacques; and Lena, Louis, 3,928,470.

Lennox Industries Inc.: *See—*
Gilles, Theodore C., 3,927,713.

Leonard, Ronald James, to Baxter Laboratories, Inc. Oxygen overpressure protection system for membrane-type blood oxygenators. 3,927,980, Cl. 23-258.500.

Lepagnol, Guy Pierre: *See—*
Bellanger, Maurice Georges; Lepagnol, Guy Pierre; and Daguet, Jacques Lucien, 3,928,755.

Leppek, William Wayne, to Globe-Union Inc. Slide potentiometer. 3,928,838, Cl. 338-183.000.

Lerner, Lewis Brian, to AMP Incorporated. Copper strike bath and method for coating electrolessly plated articles. 3,928,148, Cl. 204-38.00B.

Les Produits Associes, SA: *See—*
Moret, Michel A.; and Musy, Jean-Pierre, 3,927,435.

Lesher, George Y.: *See—*
Brundage, Ruth Pauline; and Lesher, George Y., 3,928,366.

Letraset International Limited: *See—*
Arnold, Raymond Mills; Neaves, Eric Henry Francis; and Phillips, Leslie John, 3,928,710.

Leturque, Michel: *See—*
Sperandio, Francis; and Leturque, Michel, 3,928,069.

Leung, Wan L.: *See—*
Carter, Richard S.; Hogan, Spurgeon G., Jr.; Leung, Wan L.; McGilvray, Bruce L.; and Werner, Robert H., 3,928,857.

Leva, Max. Gas-liquid contact apparatus. 3,928,513, Cl. 261-113.000.

Lever Brothers Company: *See—*
Cheesman, Jean Ann; and Coles, Cherry Pamela, 3,928,558.
Savino, Richard, 3,928,065.

Leverett, Glenn Frederick, to Du Pont de Nemours, E. I., and Company. Process for reducing electrostatic charge on polytetrafluoroethylene agglomerates. 3,928,524, Cl. 264-117.000.

Levin, Gerd. Process and apparatus for gassing brooding eggs. 3,927,642, Cl. 119-1.000.

Lewenstein, Hoshea L. Electrolytic cell with minimal water dissipation. 3,928,066, Cl. 136-6.00L.

Lewis, George W., Jr. Processes for removal of sulfur dioxide from gases. 3,928,536, Cl. 423-242.000.

Lewis, Kenneth Gill: *See—*
Armstrong, David Alun; and Lewis, Kenneth Gill, 3,928,657.

Lewmar Marine Limited: *See—*
Fawcett, Derek James, 3,927,580.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
Kaffenberger, Ernst; and Schuttloffel, Erich, 3,928,825.

Liepinsh, Martinsh Aleksandrowich: *See—*
Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 3,928,562.

Light, Kenneth K., to International Flavors & Fragrances Inc. Process for the production of resorcylic acid esters. 3,928,419, Cl. 260-473.00S.

Lightbourn, Julieta Rubio: *See—*
Ikekawa, Nobuo; Morisaki, Masuo; Lightbourn, Julieta Rubio; and Seki, Masao, 3,928,397.

Ligneres, Pierre J.: *See—*
Hugon, Jean H.; Brosseron, Jean; and Ligneres, Pierre J., 3,928,803.

Lilly Industries, Ltd.: *See—*
Chakrabarti, Jiban Kumar, 3,928,274.

Lillyman, Ernest; Mascall, Frank Charles; and Mathers, Cecil George, to United Kingdom Atomic Energy Authority. Processing of uranium hexafluoride including absorption of uranium hexafluoride in aqueous aluminum nitrate. 3,928,538, Cl. 423-260.000.

Lin, Hong: *See—*
Winchell, Harry S.; Khentigan, Archie S.; and Lin, Hong, 3,928,552.

Lindahl, Charles B.: *See—*
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,928,545.

Lindblad, Oskar Lennart. Safety belt arrangement for individuals. 3,927,902, Cl. 280-150.0SB.

Linden, Heinz; Gartner, Jurgen; Offermann, Wilhelm; and Demmering, Gunther, to Henkel & Cie G.m.b.H. Salts of amine-alkylene oxide adducts for preventing sedimentation of pigment suspensions. 3,928,276, Cl. 260-34.200.

Lindvall, Sven: *See—*
Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, 3,928,581.

Ling, Chester H. K.: *See—*
Dupree, Donald G.; Bailey, Raymond E.; and Ling, Chester H. K., 3,927,463.

Link, Otmar; and Baumann, Rudi, to AZO-Maschinenfabrik Adolf Zimmermann. Screening arrangement. 3,928,188, Cl. 209-250.000.

Linquist, Wayne A., to Greenlee Bros. and Co. Pneumatic blow gun for installing fishing line, measuring tape and polyethylene pull line in electrical conduit. 3,927,866, Cl. 254-134.400.

Linthicum, Harley E., to Carrier Corporation. Fluid actuated motor. 3,927,956, Cl. 418-100.000.

Lion Fat & Oil Co., Ltd.: *See—*
Sato, Tsutomu; Deura, Hiroshi; and Oba, Kenkichi, 3,928,268.

Livigni, Russell Anthony: *See—*
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Loebler, Peter: *See—*
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Loecher, Friedrich: *See—*
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Loewe, Heinz: *See—*
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Loewe-Opta GmbH: *See—*
Geiger, Erich, 3,928,787.

Loft, John T.; McTaggart, John A.; and Plovan, Steven G., to Celanese Corporation. Dielectric insulation employing open-celled microporous film. 3,928,705, Cl. 428-311.000.

Logan, Arthur D.: *See—*
Haren, Doyle V.; and Logan, Arthur D., 3,928,521.

Lohr, Delmar F., Jr.; and Kang, Jung W., to Firestone Tire & Rubber Company, The. Blend of high-vinyl polybutadiene and hydroformylated high-vinyl polybutadiene. 3,928,282, Cl. 260-42.440.

Long, Leo E.; and Phillips, Edward H., to American Fitness, Inc. Punching bag simulator. 3,927,879, Cl. 272-76.000.

Longhorn Construction Co., Inc.: *See—*
Nash, James C., 3,927,840.

Loomis, Lyon K. Vented cap. 3,927,798, Cl. 220-374.000.

Lopsadhayoodh Prasert, to Raymond Lee Organization, Inc., The. Remote control switching device. 3,928,737, Cl. 200-51.0LM.

Loran, Thomas J.: *See—*
Pardee, Robert P.; Loran, Thomas J.; Bickling, Archie L., Jr.; and Brown, Richard E., 3,928,673.

Loun, Bohuslav: *See—*
Kepka, Jiri; Kovarik, Karel; Loun, Bohuslav; and Zeleny, Jaromir, 3,928,827.

Lourdes Industries, Inc.: *See—*
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Lovell, James Byron: *See—*
Addor, Roger Williams; Lovell, James Byron; and Kantor, Sidney, 3,928,382.

Lovisa, Peter R.; and Tausanovitch, Dusan, to Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio, part interest to each. Internal spreader means for use with a reusable tie rod. 3,927,856, Cl. 249-177.000.

Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio E. Reusable tie assembly for concrete forms. 3,927,857, Cl. 249-217.000.

Lovisa, Tullio: *See—*
Lovisa, Peter R.; and Tausanovitch, Dusan, 3,927,856.

Lovisa, Tullio E.: *See—*
Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio E., 3,927,857.

Lower, William E.; and Ivan, Edward K., to Rotex, Inc. Wear resisting hold-down means for screening machine. 3,928,189, Cl. 209-405.000.

Lucas Aerospace Limited: *See—*
Gerrard, Alan Joseph, 3,927,835.

Luckett, Peter Robert; Mobbs, Jack Sidney; and Harris, Alan James, to Stelmo Limited. Method of making concrete pipes. 3,928,104, Cl. 156-171.000.

Lukacs, George J.: *See—*
Drelich, Arthur H.; and Lukacs, George J., 3,928,676.

Luloff, Jerome S.; and Eilender, Albert L., to Cosan Chemical Corporation. Antibacterial composition and method employing a certain hexamethylenetetramine adduct. 3,928,607, Cl. 424-249.000.

Lumber Systems, Inc.: *See—*
Ritola, Edward W., 3,927,755.

Lupica, Sebastian B., to United States of America, Energy Research and Development Administration. Method of producing thin cellulose nitrate film. 3,928,700, Cl. 428-220.000.

Luttinger, Manfred: *See—*
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Luzarraga, Mamerto G.: *See—*
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Luzzi, John J.: *See—*
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Ramey, Chester E.; and Luzzi, John J., 3,928,357.

Lynch, Edward I., to General Electric Company. Television receiver with picture level control. 3,928,867, Cl. 358-39.000.

Mac Leay, Ronald Edward; Lange, Harold Carl; and Sheppard, Chester Stephen, to Pennwalt Corporation. Curing and polymerization processes initiated by tertiary-aliphatic-alpha-(imido)-azo compounds. 3,928,493, Cl. 260-864.000.

MacMartin, Malcolm P.: *See—*
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MacTaggart, Donald, to Canadian Marconi Company. Detectability of emergency beacon. 3,928,805, Cl. 325-65.000.

Maddox, Jim, Jr.: *See—*
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Madison, Norman L.: *See—*
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Maeda, Shigeo; Ozutsumi, Minoru; Niimura, Isao; and Okazaki, Hideo, to Hodogaya Chemical Co., Ltd. Process for preparing colored polyurethane. 3,928,292, Cl. 260-77.5AQ.

Maeno, Shizuo: *See—*
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Maes, Robert: *See—*
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Magnesium Elektron Limited: *See—*
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Magnusson, Harry Olof: *See—*
Barthold, Dag Vilhelm; Dahlbom, Johan Richard; Magnusson, Harry Olof; and Sjoberg, Berndt Olof Harald, 3,928,602.

Maier, Alfred E.; and Hill, Robert H., to Westinghouse Electric Corporation. Circuit breaker with improved tripped latch means. 3,928,826, Cl. 335-22.000.

Majda, Aleksander: *See—*
Sledzinski, Bohdan; Kroczynski, Jozef; Zwierzak, Andrzej; Cieslak, Ludwika; and Majda, Aleksander, 3,928,586.

Makino, Yoshimi; Okamoto, Tsutomu; and Kamiya, Iwao, to Sony Corporation. Magnetoresistive element. 3,928,836, Cl. 338-32.00R.

Maldonado, Bernardo: *See—*
Patino, Armando; and Maldonado, Bernardo, 3,928,559.

Malek, Theodore C. Water control device for offset lithographic printing presses. 3,927,614, Cl. 101-148.000.

Mallinckrodt, Inc.: *See—*
Monte, Alexander A.; and Chiang, Ching, 3,928,137.

Mallinson, William John; Huffey, Roy Frederick; and Irvin, Geoffrey Pickles, to Imperial Chemical Industries Limited. Coated films. 3,928,697, Cl. 428-142.000.

Mancusco, Jon R.: *See—*
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Mand, Emery M.; and Shapiro, Henry C., to Walter E. Heller Factors, Inc. Decorative wall covering. 3,928,627, Cl. 427-358.000.

Mann, Henry: *See—*
Colton, John Robert; Heick, Robert Bruce; and Mann, Henry, 3,928,726.

Mannesmannrohren-Werke Aktiengesellschaft: *See—*
Schonfeld, Wolfram; Philipps, Armin; Eversberg, Hans; Hausler, Karl-Heinz; and Samans, Robert, 3,927,547.

Mantoux, Gerard: *See—*
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Marathon Oil Company: *See—*
Dreher, Karl D.; and Gogarty, William B., 3,928,215.

Marcus, Kenneth N., to Dolly Toy Company, The. Decorative nursery accessory. 3,927,482, Cl. 40-28.100.

Mares, Frantisek: *See—*
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Marinozzi, Paolo: *See—*
Pignataro, Francesco; Faletti, Franco; Castellan, Arsenio; Bossi, Alessandro; Marinozzi, Paolo; and Giordano, Nicola, 3,928,409.

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Markhart, Albert H.: *See—*
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Markl, Hans: *See—*
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Marks, Robert E., to Envirotech Corporation. Pulp digester vent system. 3,928,123, Cl. 162-238.000.

Marley, James A., Jr.; and Polata, Bohumil, to Signetics Corporation. Method for fabricating semiconductor devices using composite mask and ion implantation. 3,928,081, Cl. 148-1.500.

Marquarding, Dieter: *See—*
Hammann, Ingeborg; Hoffmann, Peter; Marquarding, Dieter; Ugi, Ivar; and Unterstenhofer, Gunter, 3,928,408.

Marrero, Louis. Electrical outlet box assembly. 3,928,716, Cl. 174-57.000.

Marriott Turner, George Frederick Albert, to Ilford Limited. Film cassette. 3,928,770, Cl. 250-481.000.

Marsh, Gary B., to Engelhard Minerals & Chemicals Corporation. Froth flotation method. 3,928,019, Cl. 75-2.000.

Marshall, Winston S.: *See—*
Lacefield, William B.; and Marshall, Winston S., 3,928,604.

Martell, Arthur E.: *See—*
Greco, Carl C.; Mirviss, Stanley B.; and Martell, Arthur E., 3,928,365.

Martella, Amelia. Knitting and crochet needle and sewing needle combination. 3,927,538, Cl. 66-117.000.

Martin Farms Partnership: *See—*
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Martin, Frederick W., to West Company, The. Apparatus for checking a dimension of an object. 3,927,476, Cl. 33-143.00L.

Martin, Harold B.; and Rogg, Herman O. Volume control for reed organ. 3,927,596, Cl. 84-355.000.

Martin Marietta Corporation: *See—*
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Martin, Myron D.: *See—*
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Martin Processing, Inc.: *See—*
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Martin, Richard E.; and Gildone, Anthony M., to GMF Inc. Dispenser for carbonated beverage or the like. 3,927,801, Cl. 222-61.000.

Martineau, Richard P. Device for signalling dirty filters. 3,928,006, Cl. 55-274.000.

Martins, Joseph G.: *See—*
Young, Raymond H., Jr.; Markhart, Albert H.; and Martins, Joseph G., 3,928,264.

Marvin Glass & Associates: *See—*
Glass, Marvin I.; Morrison, Howard J.; and Gilford, Ira B., 3,927,884.

Masai, Yukito; Kato, Yasuo; Murayama, Ken; and Fukui, Nobuhiko, to Toyo Boseki Kabushiki Kaisha (Toyo Spinning Co., Ltd.). Fireproof, thermoplastic polyester composition. 3,928,283, Cl. 260-45.70P.

Masaki, Kenji: *See—*
Shioyama, Giichi; Masaki, Kenji; and Nambu, Shuya, 3,927,523.

Mascall, Frank Charles: *See—*
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Mase, Shunzo; and Watanabe, Tetsuo, to NGK Insulators Ltd. Method for producing multilayer metallized beryllia ceramics. 3,927,815, Cl. 228-121.000.

Maser, Kenneth R., to United States of America, Interior. Remote sealing of mine passages. 3,927,719, Cl. 169-46.000.

Maslow, Frances, executor: *See—*
Maslow, Louis, deceased; Maslow, Frances, executor; and Maslow, Richard, executor, 3,927,769.

Maslow, Louis, deceased; by Maslow, Frances, executor; and by Maslow, Richard, executor, to Metropolitan Wire Goods Corporation. Shelf structure. 3,927,769, Cl. 211-153.000.

Maslow, Richard, executor: *See—*
Maslow, Louis, deceased; Maslow, Frances, executor; and Maslow, Richard, executor, 3,927,769.

Massa, Donald P.: *See—*
Massa, Frank, 3,928,777.

Massa, Frank, to Dellorfano, Fred M., Jr.; and Massa, Donald P. Directional ultrasonic transducer with reduced secondary lobes. 3,928,777, Cl. 310-8.200.

Master Packaging Equipment, Inc.: *See—*
Reid, Laurie M., 3,927,507.

Masuda, Naosuke, to Jidosha Kiki Co., Ltd. Combined load-sensing proportion and relay valve. 3,927,916, Cl. 303-22.00R.

Masukawa, Toyoaki: *See—*
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Masure, Daniel: *See—*
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Masuzawa, Isao; Awano, Tsuneo; and Onishi, Kazutoshi, to Kabushiki Kaisha Tokyo Keiki. Marine autopilot system. 3,927,635, Cl. 114-144.00E.

Matchett, Walter E. Simultaneous oil and electric transmission system and method for fabricating same. 3,928,714, Cl. 174-47.000.

Mathers, Cecil George: *See—*
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Matschkal, Heinz: *See—*
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Matsubara, Kenji; and Kanbara, Shigeo, to Nippon Kokan Kabushiki Kaisha. Process of reducing iron ores. 3,928,021, Cl. 75-35.000.

Matsubara, Syuzo: *See—*
Furuno, Kouji; Nakano, Hideki; Matsubara, Syuzo; and Shioya, Akitoshi, 3,928,583.

Matsuda, Kazuo; Ohmura, Hidemasa; and Aritaki, Hirakazu, to Kao Soap Co., Ltd. Process for preparation of anionic polyurethane emulsions. 3,928,271, Cl. 260-29.2TN.

Matsuguma, Yoshihiko: *See—*
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Matsui, Masatake: *See—*
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Matsukawa, Hiroharu; and Hayashi, Takao, to Fuji Photo Film Co., Ltd. Process for manufacturing an activated clay-coated paper for use as a pressure-sensitive copying paper. 3,928,702, Cl. 428-323.000.

Matsumoto, Hideyuki: *See—*
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Matsumoto, Keizo: *See—*
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Matsumoto, Tsutomu: *See—*
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Matsunobu, Akira: *See—*
Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, 3,928,635.

Matsuo, Kenji: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matsuyama, Junichi: *See—*
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Matsuyama, Susumu; Hirabayashi, Seishiro; Iida, Bunkichi; and Miki, Hajime, to Japan Tobacco and Salt Public Corporation, The. Air-curing process of tobacco leaf. 3,927,682, Cl. 131-140.00R.

Mattei, Silvano: *See—*
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Mattila, I. W. E-Z Removable belt guard hinge. 3,927,578, Cl. 74-608.000.

Maxon Marine Industries, Inc.: *See—*
Ingle, James E.; Emerson, Ralph W.; and Megahan, John S., 3,927,702.

Maxwell, Thomas J.: *See—*
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May, John E., to General Electric Company. Metal oxide varistor with discrete bodies of metallic material therein and method for the manufacture thereof. 3,928,242, Cl. 252-513.000.

May, William Stanley: *See—*
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Mayer, Joseph; and Sherlock, Margaret H., to Schering Corporation. 1-Amino naphthyridines. 3,928,367, Cl. 260-296.00B.

Mayfield, Johnny W. Pipe end facing and grooving machine. 3,927,584, Cl. 82-4.00C.

McBride, Warren L.: *See—*
Frye, Clifton G.; and McBride, Warren L., 3,928,178.

McCall, John W., to Formall, Inc. Conveyor hanger modular construction. 3,927,760, Cl. 198-177.00T.

McCaulay, David A., to Standard Oil Company. Alkylation process utilizing hydrofluoric acid with a minor amount of fluorosulfuric acid. 3,928,487, Cl. 260-683.510.

McClellan, David P., to I-T-E Imperial Corporation. Overload relay with means to prevent automatic reset. 3,928,833, Cl. 337-56.000.

McCluggage, Charles: *See—*
Turney, Stephen Z.; Blumenfeld, Walter; Cowley, R. Adams; Wolf, Samuel; McCluggage, Charles; and Ashworth, John W., III, 3,927,670.

McClure, Robert E., to Sperry Rand Corporation. Ring laser frequency biasing mechanism. 3,927,946, Cl. 356-106.0LR.

McConnell, George C.: *See—*
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McDonald, Donald Robson: *See—*
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McDonnell Douglas Corporation: *See—*
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McDonough, William F.; Montlick, James A.; and Bernard, Richard A., to Pitney-Bowes, Inc. Multi-detectable ink compositions and method of use. 3,928,226, Cl. 252-301.20R.

McGilvray, Bruce L.: *See—*
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McGowan, Joseph: *See—*
Carter, John L.; and McGowan, Joseph, 3,928,806.

McIntosh, Robert H.; and Hull, Ezekiel H., to Askew, Anthony B. Self-sanitizing film former. 3,928,563, Cl. 424-78.000.

McIntyre, William H.; Wallace, Richard W.; and Troha, Matthew J., to Westinghouse Electric Corporation. Gas measuring probe for industrial applications. 3,928,161, Cl. 204-195.00S.

McNeil Laboratories, Incorporated: *See—*
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McNeilly, Michael A.: *See—*
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McShane, James Edward, to Warner-Lambert Company. Process for the purification of coal tar. 3,928,579, Cl. 424-167.000.

McTaggart, John A.: *See—*
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Meckenstock, Helmut: *See—*
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Medi-Physics, Inc.: *See—*
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Medtronic, Inc.: *See—*
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Meidert, Helmut: *See—*
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Meier-Windhorst, Christian August. Process for the continuous finishing treatment of textile web materials. 3,927,971, Cl. 8-151.200.

Meierkort, Jurgen; and Schafer, Peter, to ITT Industries, Inc. Lifting jack. 3,927,864, Cl. 254-103.000.

Meihofer, Edward F., to Butler Automatic, Inc. Web break detector system. 3,928,844, Cl. 340-259.000.

Meissner, Wolfgang, to Gebr. Happich GmbH. Safety belt unwinding device with energy dissipator. 3,927,846, Cl. 242-107.400.

Meister, Herbert: *See—*
Kosswig, Kurt; and Meister, Herbert, 3,928,250.

Melaja, Asko J.; Hamalainen, Lauri; and Rantanen, Lasse, to Suomen Sokeri Osakeyhtio (Finnish Sugar Company). Process for large scale chromatography. 3,928,193, Cl. 210-31.00C.

Mellgren, Per Gustaf: *See—*
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Melville, William: *See—*
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Melzobs, Modris Janowich: *See—*
Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 3,928,562.

Mennesson, Francois, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Throttle return systems for carburettors. 3,927,657, Cl. 123-198.00D.

Mentrup, Anton: *See—*
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Menzi, Ulrich, to Hermes Precisa International S.A. Margin stop arrangement for typewriters. 3,927,754, Cl. 197-63.000.

Mercer, Alec Victor: *See—*
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Mercier, Jules, to Rhone-Poulenc Industries. Process for splitting acetals and hemiacetals. 3,928,459, Cl. 260-601.00R.

Merck & Co., Inc.: *See—*
Baldwin, John J.; and Novello, Frederick C., 3,928,361.
Bochis, Richard J.; and Fisher, Michael H., 3,928,372.
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Merianos, John J.: *See—*
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Merlina, Joseph Francis: *See—*
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Merz, Herbert: *See—*
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Mescher, Harold E.; and Heyer, Walter E., to Pacific Scientific Company. Free floating flight in a retort and method. 3,927,959, Cl. 432-3.000.

Meshberg, Philip. Applicator for attachment to a spray mist dispenser. 3,927,806, Cl. 222-402.120.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
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Metal Service Company, Inc.: *See—*
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Metropolitan Wire Goods Corporation: *See—*
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Metzger, Jacques: *See—*
Soula, Gerard; Metzger, Jacques; and Lena, Louis, 3,928,470.

Metzger, Julio, to E. R. Squibb & Sons, Inc. Amphotericin complexes. 3,928,570, Cl. 424-118.000.

Meyercord Co., The: *See—*
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Micarna AG Fleischwarenfabrik: *See—*
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Michel, Robert. Process of manufacturing phosphate fertilizer. 3,928,016, Cl. 71-42.000.

Miele, Heinrich; Orth, Winfried; and Pastorek, Emmerich, to Rutgerswerke Aktiengesellschaft. Process for the production of indanol-(4) and indanol-(5). 3,928,472, Cl. 260-628.000.

Mieras, Raymond J. Flip down door lock. 3,927,906, Cl. 292-262.000.

Miericke, Jurgen; and Uranikar, Laxmikant, to Siemens Aktiengesellschaft. Magnet system for use in the contactless guidance of a moving vehicle. 3,927,735, Cl. 104-148.0MS.

Mikazhan, Waldis Danielowich: *See—*
Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 3,928,562.

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Mikolics, Sandor; Ziegler, Karoly; and Homola, Viktor, to Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt. Cooling water supply system with self adjusting hydraulics. 3,927,531, Cl. 60-690.000.

Milberger, Ernest C.; and Dolhyj, Serge R., to Standard Oil Company, The. Process for the preparation of molybdenum-containing oxidation catalysts. 3,928,240, Cl. 252-467.000.

Milchem Incorporated: *See—*
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Milkovich, Ralph; and Chiang, Mutong T., to CPC International Inc. Chemically joined, phase separated self-cured hydrophilic thermoplastic graft copolymers and their preparation. 3,928,255, Cl. 260-2.50R.

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Mills, Ivor W.; and Dimeler, Glenn R., to Sun Oil Company of Pennsylvania. Oil and process of manufacture of blended hydrorefined oil. 3,928,168, Cl. 208-14.000.

Mills, Walter D.: *See—*
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Milzner, Karlheinz; and Reisser, Fritz, to Sandoz Ltd. Pyrimidyl phosphoro-and thiophosphoroamidates. 3,928,353, Cl. 260-256.40E.
Minaki, Toshihiro: *See—*
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Miner, Carroll R., to General Instrument Corporation. UHF Tuner drive assembly with memory fine tuning. 3,927,572, Cl. 74-10.800.
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Minsky, Norman C.; and Hiatt, Russell D., to Dart Industries Inc. Auxiliary cooking utensil leg. 3,927,610, Cl. 99-425.000.
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Mitsui Petrochemical Industries, Ltd.: *See—*
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Miyamae, Toshiaki. Fishing rod holding leverage device. 3,927,487, Cl. 43-21.200.
Miyamae, Toshiaki. Normally open type push button switch operating mechanism. 3,928,739, Cl. 200-155.00R.
Miyamori, Tamotsu: *See—*
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Mookherjee, Braja Dulal; Vock, Manfred Hugo; Benaim, Carlos; and Shuster, Edward J., to International Flavors & Fragrances Inc. Fragrance materials containing 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanol and/or 4-(6,6-dimethyl-2-methylene-3-cyclo-hexen-1-yl)-2-butanol, and/or acetals thereof, and methods for producing same. 3,928,248, Cl. 252-522.000.
Mookherjee, Braja Dulal; Trenkle, Robert Walter; Vock, Manfred Hugo; and Shuster, Edward J., to International Flavors & Fragrances Inc. Enhancing red-berry flavor with 4-(2,6,6-trimethyl-1,3-cyclohexadien-1-yl)-2-butanone and 4-(6,6-dimethyl-2-methylene-3-cyclohexen-1-yl)-2-butanone. 3,928,645, Cl. 426-538.000.
Mooney, Thomas J., to Xerox Corporation. Time dependent fault detector. 3,928,772, Cl. 307-116.000.
Moore Business Forms, Inc.: *See—*
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Moore, Oscar E.: *See—*
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Moore, Thomas B. Static-type mixer, and receptacle and method of packaging utilizing same. 3,927,868, Cl. 259-4.000.
Moori, Youichi: *See—*
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Moreau, Michele; Karadavidoff, Isaac; and Risse, Claude, to Fuveau S.A. New derivatives of alpha-methyl benzylamine in treating inflammation. 3,928,603, Cl. 424-330.000.
Moret, Michel A.; and Musy, Jean-Pierre, to Les Produits Associes, SA. Toothbrush stem attachment. 3,927,435, Cl. 15-176.000.
Morgan, James E., to PPG Industries, Inc. Process for preparing silica pigment. 3,928,540, Cl. 423-339.000.

Mori, Kentaro: *See—*
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Morikawa, Kiyoshi; Furuta, Akio; and Matsumoto, Hideyuki, to Japan Gasoline Co., Ltd.; and Nikki Chemical Co., Ltd. Low-temperature steam reforming process for hydrocarbons. 3,928,002, Cl. 48-214.000.

Morimoto, Toshihumi: *See—*
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Morita, Masanori, to Roland Corporation. Piano action. 3,927,594, Cl. 84-237.000.

Morita, Shiro; Fujiki, Konosuke; and Takeda, Kazuo, to Mitsubishi Chemical Industries Ltd. Core body for use in coil type blood dialyzer. 3,928,208, Cl. 210-321.000.

Moriyama, Hideki: *See—*
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Moriyama, Hiromi; Kuwabara, Motosuke; and Jin, Katsuyuki, to Hitachi, Ltd. Number identification circuit. 3,928,728, Cl. 179-18.0FH.

Morooka, Yasuo, to Hitachi, Ltd. Rolling method for rolling mills. 3,927,545, Cl. 72-6.000.

Morrison, Albert R.; Haynes, Harold L.; and Bell, Reuben Hays, to Owens-Corning Fiberglas Corporation. Glass fibers coated with a size containing starch esters of isoalkanoic acids. 3,928,666, Cl. 428-378.000.

Morrison, Howard J.: *See—*
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Moser, James R., deceased; and by Moser, Karen, executrix, to United States of America, Army. LiCl inhibitor for perchlorate battery. 3,928,076, Cl. 136-100.00M.

Moser, Karen, executrix: *See—*
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Mostmans, Joseph Hector: *See—*
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Mottel, Alan, to Consolidated Novelty Co., Inc. Artificial tree with hinged branches. 3,928,689, Cl. 428-9.000.

Moyle, Clarence L.; and Wolf, Paul A., to Dow Chemical Company, The. Method and composition for rapid disinfection. 3,928,575, Cl. 424-153.000.

Mruk, Norbert J., to Koppers Company, Inc. Method for the preparation of 3,3-methylenebis (benzoic acid). 3,928,430, Cl. 260-515.00P.

Mueller, David E.; and Segura, Marnell A., to Exxon Research and Engineering Company. Ore pretreatment process. 3,928,024, Cl. 75-6.000.

Muhlich, Peter: *See—*
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Mullersman, Ferdinand H., to General Electric Company. Stand-by power system. 3,928,791, Cl. 320-7.000.

Mullersman, Ferdinand Henry; and Sarisky, James Edward, to General Electric Company. Method of resetting thermostat used with temperature controlled charging. 3,928,792, Cl. 320-35.000.

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Mundlos, Eberhard; Herz, Luis; Neeb, Rudolf; Mohr, Reinhard; and Ostermeier, Johann, to Hoechst Aktiengesellschaft. Basic oxazine dyestuffs and process for their preparation. 3,928,339, Cl. 260-244.00R.

Murata Kikai Kabushiki Kaisha: *See—*
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Murayama, Ken: *See—*
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Musy, Jean-Pierre: *See—*
Moret, Michel A.; and Musy, Jean-Pierre, 3,927,435.

Muszumanski, Trude, to Vockenhuber, Karl; and Hauser, Raimund. Varifocal objective. 3,927,931, Cl. 350-184.000.

Myers, Lewis P.: *See—*
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N L Industries, Inc.: *See—*
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Smith, Malcolm Kent; and White, Robert Winslow, 3,928,060.

Naegeli, John Peter: *See—*
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Naf, Ferdinand, to Firmenich S.A. Ethyl 2-trans,4-cis-undecadienoate. 3,928,402, Cl. 260-410.90R.

Nafziger, Joel L. Animal waste treatment system. 3,927,644, Cl. 119-16.000.

Nagahama, Shizuo: *See—*
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,928,476.

Nagaoka, Yoshihiko: *See—*
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Nagase, Tsuneyuki; Suzukamo, Gohu; and Fukao, Masami, to Sumitomo Chemical Company, Limited. Isomerization of olefins. 3,928,485, Cl. 260-680.00R.

Nagata, Masao: *See—*
Awane, Yasushi; Otsuka, Sadao; Nagata, Masao; and Tanaka, Fumio, 3,928,435.

Naka, Reishi; Komatsuzaki, Shigeki; Tomobe, Tomotsuna; and Moniwa, Yoshihiro, deceased (by Moniwa, Yoshiko, administratrix), to Hitachi, Ltd. Grease composition. 3,928,214, Cl. 252-11.000.

Nakajima, Yosuke: *See—*
Nakazawa, Yoshiyuki; Nakamura, Yashuharu; Nakajima, Yosuke; Matsuyama, Junichi; and Sato, Akira, 3,928,856.

Nakamoto, Soichi: *See—*
Sakurada, Nobuaki; Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, 3,928,858.

Nakamura, Hisao: *See—*
Tanaka, Kazue; Yamamoto, Katsuo; Nakamura, Hisao; and Wakita, Eiichi, 3,927,540.

Nakamura, Matsuichi, to Daiwa Steel Tube Industries Co., Ltd. Hot dipped steel tube and a method for producing the same. 3,927,816, Cl. 228-147.000.

Nakamura, Takafumi: *See—*
Uchiyama, Mikio; Tachibana, Shinro; Araki, Kengo; and Nakamura, Takafumi, 3,928,306.

Nakamura, Yashuharu: *See—*
Nakazawa, Yoshiyuki; Nakamura, Yashuharu; Nakajima, Yosuke; Matsuyama, Junichi; and Sato, Akira, 3,928,856.

Nakane, Yoshihiko: *See—*
Konishi, Kenzo; Kotone, Akira; Nakane, Yoshihiko; Hori, Takeshi; and Hoda, Masahiro, 3,928,310.

Nakano, Hideki: *See—*
Furuno, Kouji; Nakano, Hideki; Matsubara, Syuzo; and Shioya, Akitoshi, 3,928,583.

Nakao, Yukimichi: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Fujino, Hidekazu; Tanimoto, Kenji; Hosaka, Hirokazu; Ehara, Kazunari; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; and Yasuda, Minoru, 3,928,469.

Nakata, Kazuo; and Ichikawa, Akira, to Hitachi, Ltd. Audio message generating apparatus used for query-reply system. 3,928,722, Cl. 179-1.0SM.

Nakayama, Hiroshi, to Iwatani & Co., Ltd. Electronic control system of an air conditioning apparatus. 3,927,712, Cl. 165-12.000.

Nakazawa, Yoshiyuki; Nakamura, Yashuharu; Nakajima, Yosuke; Matsuyama, Junichi; and Sato, Akira, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion for recording electron beam. 3,928,856, Cl. 346-1.000.

Nalco Chemical Company: *See—*
Allain, Ronald J.; and Seale, Virgil L., 3,928,440.
Allain, Ronald J.; and Seale, Virgil L., 3,928,443.
Ballweber, Edward G.; Tai, Wun Ten; and Selvarajan, Radhakrishnan, 3,928,448.
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Seale, Virgil L.; and Allain, Ronald J., 3,928,442.
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Namba, Kazuo: *See—*
Gondo, Hisashi; Takechi, Hiroshi; Namba, Kazuo; Usuda, Matsuo; and Kawasaki, Kouichi, 3,928,083.

Nambu, Shuya: *See—*
Shioyama, Giichi; Masaki, Kenji; and Nambu, Shuya, 3,927,523.

Nantz, Jack George, to Addressograph Multigraph Corporation. Imprint wheel assembly. 3,927,613, Cl. 101-110.000.

Napko Corporation: *See—*
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Narayan, Thirumurti L.: *See—*
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Narita, Mikio; Ohashi, Kiyoto; and Yamamoto, Jun, to Fischer & Porter Co. Electronic analog hold circuit. 3,928,810, Cl. 328-127.000.

Nash, Floyd M.: *See—*
Horan, Raymond E., Jr.; and Nash, Floyd M., 3,928,197.

Nash, James C., to Longhorn Construction Co., Inc. Refuse shredder. 3,927,840, Cl. 241-187.000.

National Starch and Chemical Corporation: *See—*
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National Steel Corporation: *See—*
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Navidyne Corporation: *See—*
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NCR Corporation: *See—*
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Criddle, Ernest E.; and Neals, Pierrette L., 3,927,667.

Neaves, Eric Henry Francis: *See—*
Arnold, Raymond Mills; Neaves, Eric Henry Francis; and Phillips, Leslie John, 3,928,710.

Neeb, Rudolf: *See—*
Mundlos, Eberhard; Herz, Luis; Neeb, Rudolf; Mohr, Reinhard; and Ostermeier, Johann, 3,928,339.

Neely, James S.; and Thompson, James A., to Procter & Gamble Company, The. Compositions of matter containing paramethoxycinnamaldehyde as a flavoring agent and sweetener. 3,928,560, Cl. 424-52.000.

Nejelski, Leo Lawrence, Jr.: *See—*
Karchmar, Arthur; and Nejelski, Leo Lawrence, Jr., 3,928,042.

Nelson, Charles J.: *See—*
Appleton, Thomas R.; Dean, Richard H.; Hillman, Edward J.; Nelson, Charles J.; and Sinn, Gunter E., 3,928,672.

Nelson, Norman A., to Upjohn Company, The. Intermediates for oxaphenylene prostaglandins. 3,928,417, Cl. 260-473.00A.

Nelson, Norman A., to Upjohn Company, The. $PGF_{2\alpha}$ -oxa phenylene compounds. 3,928,418, Cl. 260-473.00A.

Nelson, Paul. Spot light fixture. 3,928,757, Cl. 240-51.11R.

Nemoto, Yasuo: *See—*
Niimi, Itaru; Kaneko, Yasuhisa; Morita, Akiyoshi; Nemoto, Yasuo; and Sato, Mitsuyoshi, 3,928,241.

Neuroth, Norbert, to Janaer Glaswerk Schott & Gen. Transparent glass-ceramic laserable articles containing neodymium. 3,928,229, Cl. 252-301.60P.

New York University: *See—*
Hollander, Charles S., 3,928,553.

Newell, Arthur F., to Pneumatic Scale Corporation. Method of loading magazine with cartons. 3,927,777, Cl. 214-152.000.

NGK Insulators Ltd.: *See—*
Mase, Shunzo; and Watanabe, Tetsuo, 3,927,815.

Nguyen Duy, Thuoc: *See—*
Besson, Jean Georges; Nguyen Duy, Thuoc; and Palz, Wolfgang, 3,928,073.

Niehaus, Clemens: *See—*
Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, 3,928,265.

Nielson, Carl Calvin, to Bell Telephone Laboratories, Incorporated. Circuitry for providing executive ringback in a PBX system in accordance with a supplied class of service. 3,928,729, Cl. 179-18.0BG.

Nienstedt, Heinz. Apparatus for sawing up flat, rectangular blocks, in particular deep-frozen blocks of fish. 3,927,592, Cl. 83-404.200.

Nightingale, Colin Walter; and Bielstein, Georg Paul Richard, to British Copper Refiners Limited. Electrolytic refining of copper. 3,928,151, Cl. 204-106.000.

Nihon Kaiheiki Industrial Company, Ltd.: *See—*
Ohashi, Shigeo, 3,928,743.

Niimi, Itaru; Kaneko, Yasuhisa; Morita, Akiyoshi; Nemoto, Yasuo; and Sato, Mitsuyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalysts for purifying exhaust gas. 3,928,241, Cl. 252-470.000.

Niimura, Isao: *See—*
Maeda, Shigeo; Ozutsumi, Minoru; Niimura, Isao; and Okazaki, Hideo, 3,928,292.

Nikki Chemical Co., Ltd.: *See—*
Morikawa, Kiyoshi; Furuta, Akio; and Matsumoto, Hideyuki, 3,928,002.

Nilsson, Jan: *See—*
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Nippon Carbon Co. Ltd.: *See—*
Ishikawa, Toshikatsu; Endo, Tei; Masuyama, Toshio; Uruma, Fumio; Morishita, Masutaka; and Kuki, Takeshi, 3,927,986.
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Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Kawamura, Kiyoshi, 3,927,593.

Nippon Kogaku K.K.: *See—*
Kasai, Toshiyuki, 3,927,947.

Nippon Kokan Kabushiki Kaisha: *See—*
Matsubara, Kenji; and Kanbara, Shigeo, 3,928,021.

Nippon Kynol Inc.: *See—*
Koyama, Hiroaki, 3,928,526.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Yonehara, Kiyoshi; Kubota, Kunihiro; Ono, Tetsuji; and Ohara, Takashi, 3,928,239.

Nippon Soken, Inc.: *See—*
Kawai, Hisasi; and Iwase, Kazuo, 3,927,648.

Nippon Steel Corporation: *See—*
Gondo, Hisashi; Takechi, Hiroshi; Namba, Kazuo; Usuda, Matsuo; and Kawasaki, Kouichi, 3,928,083.
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Nippon Telegraph and Telephone Public Corporation: *See—*
Kato, Katsuhiro; Suzuki, Hideo; and Yano, Norio, 3,928,828.

Nishida, Takashi: *See—*
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Nishikawa, Takeo: *See—*
Shimada, Keizo; Nishikawa, Takeo; Harada, Toshiaki; and Nagahama, Shizuo, 3,928,476.

Nishizawa, Masafumi: *See—*
Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, 3,928,635.

Nissan Motor Co., Ltd.: *See—*
Inoue, Naohiko; and Moori, Youichi, 3,927,436.
Shioyama, Giichi; Masaki, Kenji; and Nambu, Shuya, 3,927,523.
Tsuneishi, Norihiro; and Miyabayashi, Yoshiyuki, 3,927,493.

Niwa, Takao: *See—*
Goto, Kenji; and Niwa, Takao, 3,927,655.

Noack, Dieter: *See—*
Beier, Helmut; and Noack, Dieter, 3,928,738.

Nobutoki, Saburo, to Hitachi, Ltd. Colour pickup tubes and method of manufacturing the same. 3,928,160, Cl. 204-192.000.

Noda, Fumiyoshi: *See—*
Kaneko, Yasuhisa; Komiyama, Yoshiro; Kondo, Katsumi; Noda, Fumiyoshi; and Uchida, Kunihiko, 3,928,662.

Nopper, Hans-Joachim: *See—*
Lang, Joseph; Meckenstock, Helmut; and Nopper, Hans-Joachim, 3,927,819.

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North American Instrument Corporation: *See—*
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North American Philips Corporation: *See—*
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Northern Electric Company Limited: *See—*
van Tongerloo, Eric Henry; Ibrahim, Abd-El-Fattah Ali; Colton, Douglas Roy; and Lawrence, John, 3,928,093.

Northup, Francis B.; and Hart, Donald R., to Spanco Industries, Inc. Apparatus for producing wrapped yarns. 3,927,515, Cl. 57-18.000.

Northwest Marine Products, Inc.: *See—*
Smith, Franklin G.; and Wilson, Gerald M., 3,927,860.

Norton Company: *See—*
Blake, Melvyn, 3,927,438.

Nottke, James E., to Du Pont de Nemours, E. I., and Company. Preparation of 3-substituted 2-hydroxyquinoxalines by reaction of 0-arylenediamines with trihalovinyl epoxides. 3,928,350, Cl. 260-250.00Q.

Noury, Jerry Lewis, Jr. Ornamented support collar for microphone and the like. 3,928,734, Cl. 179-157.000.

Novak, Edward A.; and Paclik, George F., to Garrett Corporation, The. Fluid flow sensing method and apparatus. 3,927,567, Cl. 73-204.000.

Novello, Frederick C.: *See—*
Baldwin, John J.; and Novello, Frederick C., 3,928,361.

Novex Talalmanyfejleszto es Ertekesito Kulkereskedelmi Rt.: *See—*
Mikolics, Sandor; Ziegler, Karoly; and Homola, Viktor, 3,927,531.

Novitas Nuprot SA: *See—*
Sweger, Ulf Allan, 3,928,556.

Numata, Saburo; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd. Exposure control circuit for photographic camera. 3,928,860, Cl. 354-51.000.

Nunziata, Gennaro; Schone, Rainer Walter Max; and Spadini, Gianfranco, to Procter & Gamble Company, The. Liquid detergent composition. 3,928,249, Cl. 252-526.000.

Nussbaum, Henry, to Nussbaum, Henry. Collapsible carrier for bicycles. 3,927,811, Cl. 224-42.03B.

Nusslein, Ludwig; Roder, Kurt; and Pieroh, Ernst Albrecht, to Schering Aktiengesellschaft. Method of protecting seeds and plants against fungi. 3,928,615, Cl. 424-263.000.

Oba, Kenkichi: *See—*
Sato, Tsutomu; Deura, Hiroshi; and Oba, Kenkichi, 3,928,268.

Obermeier, Karl: *See—*
Heuschen, Alexander; Schaefer, Hans; Budich, Wolfgang; Krah, Robert; and Obermeier, Karl, 3,928,100.

O'Brian, Edward D.: *See—*
Stults, Allan C.; Powell, Raymond H.; and O'Brian, Edward D., 3,927,597.

O'Brien, John T.: *See—*
Settineri, Robert A.; and O'Brien, John T., 3,928,690.

Ocean Drilling & Exploration Company: *See—*
Childers, Mark A.; and Dawkins, Enoch L., 3,927,636.

Oda, Fujio; and Otani, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Record stylus. 3,927,887, Cl. 274-38.000.

Oehler-Wyhlen-Lagertechnik A.G.: *See—*
Flosser, Walter, 3,927,495.

Oellig, Rudi: *See—*
Jellinek, Karl; and Oellig, Rudi, 3,928,287.

Oesterlin, Rudolf: *See—*
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Offermann, Wilhelm: *See—*
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Ogawa, Yukio: *See—*
Kobayashi, Kazuhiro; Saito, Hiroshi; Ogawa, Yukio; Yoshida, Koki; and Kondo, Isamu, 3,927,454.

Oguey, Henri J.; and Vittoz, Eric Andre, to Centre Electronique Horloger S.A. Logical circuit with field effect transistors. 3,928,773, Cl. 307-225.00C.

Ohara, Takashi: *See—*
Yonehara, Kiyoshi; Kubota, Kunihiro; Ono, Tetsuji; and Ohara, Takashi, 3,928,239.

Ohashi, Kiyoto: *See—*
Narita, Mikio; Ohashi, Kiyoto; and Yamamoto, Jun, 3,928,810.

Ohashi, Shigeo, to Nihon Kaiheiki Industrial Company, Ltd. Rocker switch with position indicator. 3,928,743, Cl. 200-308.000.

Ohloff, Gunther: *See—*
Kovats, Ervin; Demole, Edouard; Ohloff, Gunther; and Stoll, Max, deceased, 3,928,456.

Ohmori, Akio: *See—*
Ashikaga, Tadao; Ohmori, Akio; and Ando, Masasi, 3,928,261.

Ohmori, Masahiko; Tomatsu, Toshiharu; and Iwata, Tadao, to Mitsui Petrochemical Industries, Ltd. Process for preparing graft-modified ethylene plyomer or copolymer. 3,928,497, Cl. 260-878.00R.

Ohmura, Hidemasa: *See—*
Matsuda, Kazuo; Ohmura, Hidemasa; and Aritaki, Hirakazu, 3,928,271.

Ohotsubo, Hiro; Fujikura, Suguru; and Miyata, Yoshimitsu, to Oji-Yuka Synthetic Paper Company, Ltd. Process of producing pressure sensitive recording sheets. 3,928,099, Cl. 156-83.000.

Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, to Ton Co., Ltd.; and Fuji Oil Company, Ltd. Method for preparation of peanut flakes from peanut kernels. 3,928,635, Cl. 426-312.000.

Ohtsuka, Michio: *See—*
Hosoki, Shigeru; Ohtsuka, Michio; and Fukuhara, Satoru, 3,928,783.

Oikawa, Shigeki: *See—*
Satoh, Hirokazu; Takeuchi, Hidesato; and Oikawa, Shigeki, 3,928,539.

Oishi, Yasushi: *See—*
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Yokota, Yukio; Tanaka, Mitsugu; and Inouye, Kozo, 3,928,044.

Oji-Yuka Synthetic Paper Company, Ltd.: *See—*
Ohotsubo, Hiro; Fujikura, Suguru; and Miyata, Yoshimitsu, 3,928,099.

Oka, Koichiro: *See—*
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Oka, Santaro: *See—*
Tsunoda, Tatsui; Oka, Santaro; Miyamoto, Kazuma; Matsumoto, Makoto; and Baba, Heiji, 3,928,045.

Okabe, Nobuya, to Hitachi Construction Machinery Co., Ltd. Excavator. 3,927,781, Cl. 214-763.000.

Okamoto, Tsutomu: *See—*
Makino, Yoshimi; Okamoto, Tsutomu; and Kamiya, Iwao, 3,928,836.

Okazaki, Hideo: *See—*
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Oki Electric Industry Company Ltd.: *See—*
Takahashi, Kazunori; and Fukasawa, Atsushi, 3,928,824.

Okumichi, Toshiharu: *See—*
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Okuno, Nobuyoshi: *See—*
Kishi, Noboru; Ota, Yoshitaka; and Okuno, Nobuyoshi, 3,928,396.

Okuno, Toshio; and Sasaki, Rinzo, to Hitachi Metals, Ltd. Tool steel for hot working. 3,928,025, Cl. 75-128.00B.

O'Leary, Kevin J.; Tomba, Charles P.; and Fenn, Robert W., III, to Diamond Shamrock Corporation. Dimensionally adjustable anode-dimensionally stable diaphragm combination for electrolytic cells. 3,928,166, Cl. 204-282.000.

Olin Corporation: *See—*
Alexander, Roy P., 3,928,258.
Ford, James A.; and Butt, Sheldon H., 3,928,234.
Fuzesi, Stephen; and Syrop, Allan H., 3,928,257.
Yarwood, John C., 3,928,028.

Olson, Donald M.; and McNeilly, Michael A. Magnetic release system for snow skis. 3,927,897, Cl. 280-11.35M.

Olson, Gary Lee; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Process for producing vitamin A. 3,928,400, Cl. 260-410.90V.

Olson, Irving C., to United States of America, Navy. Decoupling apparatus for a common-antenna receive-transmit system. 3,928,853, Cl. 343-180.000.

Olthuis, Eugene G., to General Electric Company. Self-locking trim frame for built-in cooktop. 3,927,658, Cl. 126-214.00A.

Omori, Akira: *See—*
Suzuki, Hideaki; Togawa, Haruo; Omori, Akira; and Yamamoto, Naoki, 3,927,968.

Omura, Yoshiaki: *See—*
Fujita, Yoshiji; Omura, Yoshiaki; Nishida, Takashi; and Itoi, Kazuo, 3,928,403.

O'Neill, Cormac G., to Physics International Company. Fuel injection system for internal combustion engines. 3,927,652, Cl. 123-139.0AT.

O'Neill, Gerald Joseph: *See—*
Billings, Charles Alden; O'Neill, Gerald Joseph; and Simons, Charles William, 3,928,468.

Onishi, Kazutoshi: *See—*
Masuzawa, Isao; Awano, Tsuneo; and Onishi, Kazutoshi, 3,927,635.

Onishi, Toshio: *See—*
Fukuda, Yoshiharu; Onishi, Toshio; and Takeuchi, Akitoshi, 3,928,053.

Ono, Tetsuji: *See—*
Yonchara, Kiyoshi; Kubota, Kunihiro; Ono, Tetsuji; and Ohara, Takashi, 3,928,239.

Ono, Tomoyoshi; and Matsuguma, Yoshihiko, to Teijin Limited. Pressure-sensitive adhesive compositions containing hydroxy-ethyl cellulose. 3,928,262, Cl. 260-17.00R.

Onoda Cement Company, Ltd.: *See—*
Fukuda, Yoshiharu; Onishi, Toshio; and Takeuchi, Akitoshi, 3,928,053.

Onoda Chemical Industry Company, Limited: *See—*
Satoh, Hirokazu; Takeuchi, Hidesato; and Oikawa, Shigeki, 3,928,539.

Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Process for preparing mesitylenic acid. 3,928,433, Cl. 260-524.00R.

Ooka, Takayuki; and Aihara, Shinji, to Mitsui Shipbuilding and Engineering Co., Ltd.; and Osaka Jack Mfg. Co., Ltd. Scaffold. 3,927,732, Cl. 182-36.000.

Oppenlaender, Knut: *See—*
Dachs, Karl; Faulhaber, Gerhard; Fikentscher, Rolf; Oppenlaender, Knut; and Schulze, Joachim, 3,928,688.

Optical Coating Laboratory, Inc.: *See—*
Sprout, James Cole; and Berman, Herbert L., 3,928,843.

Orito, Zen-ichi; Uchida, Minoru; Takesue, Masatoshi; Sahara, Hajime; and Fujii, Kihiro, to Mitsubishi Rayon Co., Ltd. Process for producing acrylic fibers having excellent pilling resistance. 3,928,528, Cl. 264-344.000.

Orser, David A., to General Electric Company. Benzyl and (benzyl)-benzylanthraquinones. 3,928,394, Cl. 260-369.000.

Orth, Winfried: *See—*
Miele, Heinrich; Orth, Winfried; and Pastorek, Emmerich, 3,928,472.

Ortner, Herbert: *See—*
Hambsch, Erich; Klug, Helmut; Ortner, Herbert; Semmlinger, Walter; and Wirtz, Rudolf, 3,928,503.

Osaka Jack Mfg. Co., Ltd.: *See—*
Ooka, Takayuki; and Aihara, Shinji, 3,927,732.

Osteen, Mitchell M.; and Martin, Myron D., to General Electric Company. Floodlight. 3,928,758, Cl. 240-73.00R.

Ostermeier, Johann: *See—*
Mundlos, Eberhard; Herz, Luis; Neeb, Rudolf; Mohr, Reinhard; and Ostermeier, Johann, 3,928,339.

Ota, Yoshitaka: *See—*
Kishi, Noboru; Ota, Yoshitaka; and Okuno, Nobuyoshi, 3,928,396.

Otani, Hiroshi: *See—*
Oda, Fujio; and Otani, Hiroshi, 3,927,887.

Othmer, Donald F. Process for producing power, fresh water, and food from the sea and sun. 3,928,145, Cl. 203-11.000.

Otouma, Takashi; Aoki, Susumu; Minaki, Toshihiro; Shibata, Kenichi; and Mori, Kentaro, to Japan Asbestos Co., Ltd. Alkali-resistant mineral fibers useful for the reinforcement of various moulded articles. 3,928,049, Cl. 106-50.000.

Otsuji, Masaaki: *See—*
Fuwa, Masaru; Takahashi, Kiyoshi; Otsuji, Masaaki; and Matsui, Masatake, 3,928,525.

Otsuka, Sadao: *See—*
Awane, Yasushi; Otsuka, Sadao; Nagata, Masao; and Tanaka, Fumio, 3,928,435.

Owen, Hartley, to Mobil Oil Corporation. Upgrading crude oil by combination processing. 3,928,175, Cl. 208-93.000.

Owens-Corning Fiberglas Corporation: *See—*
Morrison, Albert R.; Haynes, Harold L.; and Bell, Reuben Hays, 3,928,666.

Owens-Illinois, Inc.: *See—*
Crawford, James E.; and Gray, Don N., 3,928,294.
Jasinski, John, 3,928,050.
Vergano, Peter J.; and Smith, William E., deceased, 3,928,096.

Oy Medica Ab: *See—*
Broderman, Thord; Hietala, Pentti; and Sundman, Jacobus, 3,928,431.

Oyaide, Kenji: *See—*
Shinomoto, Masanori; Oyaide, Kenji; and Shinkawa, Etsuo, 3,928,520.

Ozutsumi, Minoru: *See—*
Maeda, Shigeo; Ozutsumi, Minoru; Niimura, Isao; and Okazaki, Hideo, 3,928,292.

Pachter, Irwin J.: *See—*
Rajagapalan, Parthasarathi; and Pachter, Irwin J., 3,928,611.

Pacific Scientific Company: *See—*
Mescher, Harold E.; and Heyer, Walter E., 3,927,959.

Paclik, George F.: *See—*
Novak, Edward A.; and Paclik, George F., 3,927,567.

Pagdin, Brian Colin, to GKN Transmissions Limited. Fuel injection apparatus for internal combustion engines. 3,927,653, Cl. 123-140.0MC.

Pallos, Ferenc M., to Stauffer Chemical Company. Derivatives of certain N-oxypyridyl geranyl ethers used in controlling insects. 3,928,616, Cl. 424-263.000.

Pallos, Ferenc M., to Stauffer Chemical Company. Method of controlling insects using certain formamidine compounds containing trihalomethyl groups. 3,928,623, Cl. 424-326.000.

Pallos, Ferenc Marcus, to Stauffer Chemical Company. Certain nonterpenoid juvenile hormone mimicking compounds and their use in controlling insects. 3,928,622, Cl. 424-320.000.

Palm, Bengt Arne: *See—*
Johansson, Bjorn-Olow; and Palm, Bengt Arne, 3,927,974.

Palmer, George William, to Stateside Machinery Co. Profile stitching machines. 3,927,628, Cl. 112-121.120.

Palz, Wolfgang: *See—*
Besson, Jean Georges; Nguyen Duy, Thuoc; and Palz, Wolfgang, 3,928,073.

Pantier, Earl A.: *See—*
Jackovitz, John F.; Pantier, Earl A.; and Wu, Christopher K., 3,928,068.

Panusch, Erwin; and Sobolev, Igor, to Kaiser Aluminum & Chemical Corporation. Process for making methyl glucoside. 3,928,318, Cl. 260-210.00R.

Papa, Sisto; Moiso, Ugo; and Ferrario, Renzo, to Aziende Colori Nazionali Affini ACNA S.p.A. Hydrosoluble trisazoic dyes, mixtures thereof and the use thereof. 3,927,963, Cl. 8-26.000.

Papa, Sisto Sergio; and Ferrario, Renzo, to Aziende Colori Nazionali Affini ACNA S.p.A. Trisazo dyestuff. 3,928,313, Cl. 260-173.000.

Papalexis, Gregory C.; and Elliott, Richard I. Dough degasser and developer. 3,927,611, Cl. 99-472.000.

Papay, Andrew G.; Matthews, Brian W.; and Thomas, Arthur S., to Edwin Cooper, Inc. Lubricating oil compositions of improved rust inhibition. 3,928,219, Cl. 252-51.50R.

Papayoti, Hristo V., to Unistrut Corporation. Space frame floor column system. 3,927,499, Cl. 52-263.000.

Pappalardo, Romano G.; and Smith, Robert, to GTE Laboratories Incorporated. High gain pulsed ion laser. 3,928,820, Cl. 331-94.50G.

Pardee, Robert P.; Loran, Thomas J.; Bickling, Archie L., Jr.; and Brown, Richard E., to Ball Brothers Research Corporation. Release and lubricating composition for glass molds and method and apparatus utilizing such composition. 3,928,673, Cl. 427-135.000.

Parker, John A.: *See*—
Fohlen, George M.; Parker, John A.; and Sawko, Paul M., 3,928,708.

Parsons, Hubert J.; and Peterson, Anders Adolf, to Hardinge Brothers, Inc. Apparatus for loading a workpiece into a rotating collet or chuck. 3,927,583, Cl. 82-2.500.

Parviainen, Raimo Johannes: *See*—
Engdahl, Holger Gustaf; and Parviainen, Raimo Johannes, 3,928,209.

Passmore, Edmund M., to GTE Sylvania Incorporated. Electrically conductive refractory body. 3,928,244, Cl. 252-520.000.

Pastorek, Emmerich: *See*—
Miele, Heinrich; Orth, Winfried; and Pastorek, Emmerich, 3,928,472.

Patenaude, Clifford J.: *See*—
Allen, Herman C.; and Patenaude, Clifford J., 3,927,501.

Patino, Armando; and Maldonado, Bernardo, to Colgate-Palmolive Company. Dental cream. 3,928,559, Cl. 424-49.000.

Paul, Rajendra: *See*—
Gordon, Robert E.; Jones, Robert W.; Paul, Rajendra; and Simon, Robert H. M., 3,927,983.

Pauli, Jude A.: *See*—
Willner, Richard; Pauli, Jude A.; and Latuda, Frank A., 3,927,829.

Paver, Roger: *See*—
Fleck, Fritz; Schmid, Horst; Mercer, Alec Victor; and Paver, Roger, 3,928,329.

Pavlin, Cyrille Francois; Mantoux, Gerard; Giraud, Adrien; and Grossin, Michele, to Bertin & Cie; and Compagnie Francaise des Petroles. Apparatus and method for measuring the mass flow of a fluid stream. 3,927,565, Cl. 73-194.00M.

Pavlish, Allen T. Refuse bag retainer. 3,927,445, Cl. 24-243.00K.

Pawliw, John; and Zabrodsky, Jarda, to General Electric Company. Sheath for nuclear fuel elements. 3,928,130, Cl. 176-67.000.

Peacock Investments (Proprietary) Limited: *See*—
Raubenheimer, Johann Nicolaas, 3,928,202.

Pearson, Raymond H. Toilet deodorizing accessory including leak proof connection. 3,927,429, Cl. 4-213.000.

Pearson, Richard K.: *See*—
Gregg, David W.; and Pearson, Richard K., 3,928,821.

Peddy, Aubrey R. Device for preventing twists in fishing lines. 3,927,488, Cl. 43-25.000.

Peelman, Harold E., to Texaco Inc. Pulsed neutron combination well logging system. 3,928,762, Cl. 250-270.000.

Pei, Jack C.: *See*—
Kitahara, Hitoshi; and Pei, Jack C., 3,927,940.

Peiperl, Adam. Method of making randomly different display devices. 3,927,461, Cl. 29-424.000.

Peisker, Glenn W., to Chicago Rawhide Manufacturing Company. Method of forming a molding core for use in forming a seal unit. 3,927,600, Cl. 90-11.00C.

Pellegrino, Peter P. Composite plating tape. 3,928,692, Cl. 428-54.000.

Pennwalt Corporation: *See*—
Mac Leay, Ronald Edward; Lange, Harold Carl; and Sheppard, Chester Stephen, 3,928,493.

Perini, Fulvio, to Syntex (U.S.A.) Inc. Enzymatic processes for hydrolyzing proteins. 3,928,630, Cl. 426-7.000.

Perr, Julius P., to Cummins Engine Company, Inc. Fuel supply system. 3,927,654, Cl. 123-140.0FG.

Perry, Walter Merton. Rotary forming unit for fine mineral fibers. 3,928,009, Cl. 65-14.000.

Persinski, Leonard John; Ralston, Paul Hotchkiss; and Gordon, Robert Cornelius, Jr., to Calgon Corporation. Inhibition of scale deposition. 3,928,196, Cl. 210-58.000.

Persson, Karl Rune, to Sprinter Pack AB. Blank of a foldable material such as cardboard and a tray erected therefrom. 3,927,823, Cl. 229-31.00R.

Petersen, Ross K. Filtering apparatus. 3,928,008, Cl. 55-472.000.

Peterson, Anders Adolf: *See*—
Parsons, Hubert J.; and Peterson, Anders Adolf, 3,927,583.

Peterson, Dean M., to Honeywell Inc. Shutter-iris for automatic camera. 3,928,859, Cl. 354-27.000.

Peterson, Roger L., to Dyna-Therm Corporation, The. Fire protective composition for use with electrical cables. 3,928,210, Cl. 252-8.100.

Petrocci, Alfonso N.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 3,928,323.

Petrolite Corporation: *See*—
Wilson, Homer M., 3,928,774.

Petrovich, Vojislav. Phenolaldimines as froth flotation reagents. 3,928,185, Cl. 209-166.000.

Petrusek, Victor. Step on bug game. 3,927,880, Cl. 273-1.00E.

Pfaff Industriemaschinen GmbH: *See*—
Vollmar, Kurt, 3,927,629.

Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex (U.S.A.) Inc. Novel substituted xanthone carboxylic acid compounds. 3,928,379, Cl. 260-335.

Pfizer Inc.: *See*—
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,928,391.
Rosati, Robert L., 3,928,324.

Philip Morris Incorporated: *See*—
Braginetz, Paul A., 3,927,473.

Philippe, Leon Jean; Defraye, Rene Charles; and Renard, Lucien Paul, to Centre de Recherches Metallurgiques - Centrum voor Research in de Metallurgie. Determination of properties of metals. 3,927,558, Cl. 73-95.000.

Philipps, Armin: *See*—
Schonfeld, Wolfram; Philipps, Armin; Eversberg, Hans; Hausler, Karl-Heinz; and Samans, Robert, 3,927,547.

Phillips, Edward H.: *See*—
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Phillips, Leslie John: *See*—
Arnold, Raymond Mills; Neaves, Eric Henry Francis; and Phillips, Leslie John, 3,928,710.

Phillips Petroleum Company: *See*—
Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., 3,928,389.
Frazier, Arthur E., 3,927,988.
Higbee, David E.; and Powell, William D., Jr., 3,928,661.
Huxley, Edward E., 3,928,385.
James, John P., 3,928,173.
South, Aubrey, Jr., 3,928,270.
Taylor, Peter A.; and Su, Tsung-Yuan, 3,928,269.
Tieszen, Dale O., 3,928,675.
Uraneck, Carl A.; and Burleigh, John E., 3,928,498.

Phillips, Robert W., to Colorado State University Research Foundation. Method and composition for treating diarrhea in mammals. 3,928,574, Cl. 424-153.000.

Phillips, Wendell O.: *See*—
Fabris, Hubert J.; and Phillips, Wendell O., 3,928,502.

Philp, Dennis H.; and Madison, Norman L., to Dow Chemical Company, The. Odorless electroconductive latex composition. 3,928,695, Cl. 428-95.000.

Phipps, Charles M.: *See*—
Hayes, Douglas R.; and Phipps, Charles M., 3,927,710.

Phoenix Closures, Inc.: *See*—
Pollock, William J.; and Tagalakis, Peter, 3,928,109.

Phsiological Electronics Corporation: *See*—
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Physics International Company: *See*—
O'Neill, Cormac G., 3,927,652.

Pieroh, Ernst Albrecht: *See*—
Nusslein, Ludwig; Roder, Kurt; and Pieroh, Ernst Albrecht, 3,928,615.

Pierson, Robert M.: *See*—
Arconti, Richard J.; and Pierson, Robert M., 3,928,110.

Piester, Loyd W., to PPG Industries, Inc. Electrolytic cell including means for separating chlorine from the chlorine-electrolyte froth formed in the cell. 3,928,165, Cl. 204-278.000.

Pieters, Wim J. M.: *See*—
Daley, William D.; Wilkalis, John E.; and Pieters, Wim J. M., 3,928,547.

Pifferi, Giorgio, to I.S.F. S.p.A. Alpha-hydrazi nobenzylpenicillins. 3,928,325, Cl. 260-239.100.

Pigeaud, Jean-Marie: *See*—
Buoy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,928,167.

Pignataro, Francesco; Faletti, Franco; Castellan, Arsenio; Bossi, Alessandro; Marinozzi, Paolo; and Giordano, Nicola, to Montedison S.p.A. Catalytic process for preparing unsaturated nitriles from olefins, ammonia and oxygen. 3,928,409, Cl. 260-465.300.

Pike, John E.; and Schneider, William P., to Upjohn Company, The. 11β,15β-PGE$_2$,15β-PGF$_2$, and 15β-PGF$_2$, 15-acetates methyl esters. 3,928,425, Cl. 260-488.00R.

Pilot Kiko Kabushiki Kaisha: *See*—
Shinomoto, Masanori; Oyaide, Kenji; and Shinkawa, Etsuo, 3,928,520.

Pinguad, Bernard J.: *See*—
Audran, Roger G. L.; and Pinguad, Bernard J., 3,928,709.

Pinker, Richard Alfred: *See*—
Bryce, William Dean; Pinker, Richard Alfred; and Turner, Brian Arthur, 3,927,522.

Pischke, Lamonte D.: *See*—
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Pitkanen, Alan Ralph: *See*—
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Pitney-Bowes, Inc.: *See*—
McDonough, William F.; Montlick, James A.; and Bernard, Richard A., 3,928,226.
Sansone, Ronald P., 3,928,759.

Pittet, Alan O.: *See*—
Schreiber, William Lewis; Vock, Manfred; Shuster, Edward Joseph; and Pittet, Alan O., 3,928,644.

Platz, Rolf: *See*—
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Plempel, Manfred: *See—*
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Plessey Handel und Investments A.G.: *See—*
Rowe, Stephen Henry; Bass, John Charles; and Goodfellow, Robert Charles, 3,928,102.

Plovan, Steven G.: *See—*
Loft, John T.; McTaggart, John A.; and Plovan, Steven G., 3,928,705.

Plumadore, John D., to Scott Paper Company. Apparatus for developing an electrostatic latent image on an electrophotographic film. 3,927,639, Cl. 118-637.000.

Plumlee, Oscar M. Fire resistant paneling system. 3,927,500, Cl. 52-460.000.

Pneumatic Scale Corporation: *See—*
Newell, Arthur F., 3,927,777.

Poeschl, Rudolf, to Feldmuhle Anlagen- und Produktionsgesellschaft mit beschrankter Haftung. Water extraction apparatus for paper-making machine. 3,928,125, Cl. 162-352.000.

Pohl, Karl-Heinz; and Schierle, Jack Theodore, to Bell Telephone Laboratories, Incorporated. Mask alignment method. 3,927,943, Cl. 355-132.000.

Pohlman, Reimar; and Cichos, Manfred. Device for fragmenting urinary calculus. 3,927,675, Cl. 128-328.000.

Polak, Slaw: *See—*
Kosmiderski, Szymon; and Polak, Slaw, 3,928,628.

Polaroid Corporation: *See—*
Goldberg, Paul; and van Heerden, Pieter J., 3,927,930.
Ivester, Andrew S.; and Johnson, Bruce K., 3,928,862.
Land, Edwin H., 3,928,665.

Polata, Bohumil: *See—*
Marley, James A., Jr.; and Polata, Bohumil, 3,928,081.

Poley, Neil Myron: *See—*
Edwards, Roger Joseph; Hairabedian, Barouyr Zareh; and Poley, Neil Myron, 3,928,781.

Pollack, Philip; and Di Matteo, Paul L., to Sperry Rand Corporation. Interfering signal sensor for angle tracking radars. 3,928,850, Cl. 343-7.300.

Pollner, Rudolf: *See—*
Esper, Friedrich J.; Friese, Karl-Hermann; and Pollner, Rudolf, 3,928,837.

Pollock, William J.; and Tagalakis, Peter, to Phoenix Closures, Inc. Method of assembling and bonding a laminated liner within a closure member. 3,928,109, Cl. 156-272.000.

Polsky, George. Transportable jack. 3,927,863, Cl. 254-103.000.

Polster, Rudolf: *See—*
Pommer, Ernst-Heinrich; Polster, Rudolf; Loecher, Friedrich; and Hampel, Manfred, 3,928,606.

Polysar Limited: *See—*
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Pommer, Ernst-Heinrich; Polster, Rudolf; Loecher, Friedrich; and Hampel, Manfred, to BASF Aktiengesellschaft. Fungicidal composition containing diisopropyl 3-nitrophthalate and N-tridecyl-2,6-dimethylmorpholine. 3,928,606, Cl. 424-248.000.

Poot, Albert Lucien; Heugebaert, Frans Clement; Janssens, Wilhelmus; and Vandenberghe, Antoon Leon, to Agfa-Gevaert N.V. Heat-sensitive recording materials. 3,928,686, Cl. 428-457.000.

Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich. Polymer derivative of β-diethylaminoethyl ester of p-aminobenzoic acid with cellulose glycolic acid, method of producing and application thereof. 3,928,562, Cl. 424-78.000.

Portec, Inc.: *See—*
Skeltis, Anthony John; Rostafinski, Jaroslaw Joseph; and Ravani, Chandrakant Dhanjibhai, 3,927,621.

Porter, Robert P.: *See—*
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Possis Corporation: *See—*
Dammar, Raymon H., 3,927,456.
Dammar, Raymon H., 3,927,469.
Dammar, Raymon H., 3,927,843.

Pouch, Thomas M.; and Ladouceur, Harold A., to Multifastener Corporation. Apparatus for assembling self-fastening nut to a panel. 3,927,452, Cl. 29-200.00B.

Powell, Jack B., to International Business Machines Corporation. Spiral braid connector. 3,927,926, Cl. 339-74.00R.

Powell Manufacturing Company, Inc.: *See—*
Wilson, Robert W.; and Akins, Eugene T., 3,927,683.

Powell, Raymond H.: *See—*
Stults, Allan C.; Powell, Raymond H.; and O'Brian, Edward D., 3,927,597.

Powell, William D., Jr.: *See—*
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PPG Industries, Inc.: *See—*
Cramer, Deane G., 3,928,010.
Harrell, William C.; and Foster, Homer R., 3,928,012.
Knavish, Leonard A., 3,928,014.
Morgan, James E., 3,928,540.
Piester, Loyd W., 3,928,165.
Rahn, Henry W.; Cunningham, Hugh; Dilmore, Colonel R.; Jeffery, Thomas C.; and Raetzsch, Carl W., 3,928,150.
Schornhorst, James R., 3,928,011.
Wismer, Marco; and Bosso, Joseph F., 3,928,156.

Pradota, Thaddeus T. Machine chuck jaws and the method of making the same. 3,927,892, Cl. 279-62.000.

Prasad, Raj Nandan, to Abbott Laboratories. N^1-oxides of adenosine-5'-carboxylates for treating angina. 3,928,582, Cl. 424-180.000.

Precitec GmbH: *See—*
Schmall, Karl Heinz, 3,928,790.

Prentice, James Bruce: *See—*
Temple, Robert Dwight; Heuring, Vincent Paul; and Prentice, James Bruce, 3,928,213.

Prillinger, Peter F. M.; and Rosenberger, Paul C., to Caterpillar Tractor Co. Annular dual piston brake arrangement. 3,927,737, Cl. 188-106.00F.

Prince, John Luther, III: *See—*
Schwettmann, Frederic Nickels; and Prince, John Luther, III, 3,928,082.

Procter & Gamble Company, The: *See—*
Bolich, Raymond Edward, Jr.; and Aylor, Robert Benson, 3,928,251.
Curry, John Downing, 3,928,605.
Fryar, Durward, 3,928,003.
Gupta, Monoj Kumar, 3,928,647.
Neely, James S.; and Thompson, James A., 3,928,560.
Nunziata, Gennaro; Schone, Rainer Walter Max; and Spadini, Gianfranco, 3,928,249.
Speakman, Peter Roscoe Hartley, 3,927,967.
Temple, Robert Dwight; Heuring, Vincent Paul; and Prentice, James Bruce, 3,928,213.

Proctor, William L.: *See—*
Wyatt, Philip J.; Stull, Vincent R.; Proctor, William L.; and Miller, Irving L., 3,928,140.

Prodel, Ulrich Heinrich. Bottle packing. 3,927,789, Cl. 220-21.000.

Pruess, David: *See—*
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Puetz, Jordan F., to Square D Company. Rejection-type cartridge fuse clip. 3,927,929, Cl. 339-258.00F.

Pullukat, Thomas, to Chemplex Company. Method of making polyolefins using organotin chromate polymerization catalyst. 3,928,304, Cl. 260-94.90D.

Purwinsh, Indulis Waldowich: *See—*
Pormale, Milda Janovna; Kashkina, Nadezhda Alexandrovna; Kalninsh, Arvid Janovich; Sergeeva, Varvara Nikolaevna; Surna, Janis Alexandrovich; Shusters, Janis; Melzobs, Modris Janowich; Mikazhan, Waldis Danielowich; Purwinsh, Indulis Waldowich; Skutelis, Antons Petrowich; and Liepinsh, Martinsh Aleksandrowich, 3,928,562.

Pustell, Robert Algerd; and Haselton, Thomas Parker, to General Electric Company. Multiple spring socket for pin connector. 3,927,928, Cl. 339-256.00R.

Putvinski, Thomas Michael: *See—*
Broadhead, John; Putvinski, Thomas Michael; and Trumbore, Forrest Allen, 3,928,067.

Pyles, Alvin C.: *See—*
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Quake-Proof, Inc.: *See—*
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Quality Food Machinery Inc.: *See—*
Campbell, William A., III, 3,927,508.

Quang, Pham Kim, to La Cellophane. Methods of and apparatus for reproducing images by transferring electrostatic charges. 3,928,032, Cl. 96-1.00R.

Quentron Optics Pty Ltd: *See—*
Hughes, John Leonard, 3,928,811.

Quigley, Richard J.: *See—*
Reynolds, Clarke; and Quigley, Richard J., 3,927,742.

Quinn, John N. Crushing apparatus. 3,927,839, Cl. 241-76.000.

Quinn, Ronald E., to General Motors Corporation. Recirculating combustion apparatus. 3,927,958, Cl. 431-116.000.

R. M. Smith, Inc.: *See—*
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Raaphorst, Cornelius, to Hoogovens Ijmuiden, B.V. Blow off valve for a blast furnace. 3,927,859, Cl. 251-147.000.

Raetzsch, Carl W.: *See—*
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Rahn, Henry W.; Cunningham, Hugh; Dilmore, Colonel R.; Jeffery, Thomas C.; and Raetzsch, Carl W., to PPG Industries, Inc. Method of operating an electrolytic cell having hydrogen gas disengaging means. 3,928,150, Cl. 204-98.000.

Raimondi, Albert A.: *See—*
Adams, Maurice L., Jr.; and Raimondi, Albert A., 3,927,889.

Rajagopalan, Parthasarathi; and Pachter, Irwin J., to Endo Laboratories. Tris- and tetrakis- (1,2,3,4-tetrahydroisoquinoline) and -[3,4-dihydroisoquinoline] compounds in inhibiting and dissolving blood clots. 3,928,611, Cl. 424-258.000.

Ralston, Paul Hotchkiss: *See—*
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Ralston Purina Company: *See—*
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Khayat, Ali; Courtney, George W.; and Dunn, Howard J., 3,928,637.
Lanter, Kent J., 3,928,652.

Ramaker, Dudley D.; and Keller, Roger W., to FMC Corporation. Safety shield for rotary mower. 3,927,513, Cl. 56-320.100.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Substituted piperazinedione carboxylic acids and metal salts thereof. 3,928,330, Cl. 260-242.000.

Ramey, Chester E.; and Luzzi, John J., to Ciba-Geigy Corporation. Substituted piperazine diones and polymeric compositions stabilized thereby. 3,928,357, Cl. 260-268.0TR.

Randall, David I.; and Wynn, Robert W., to GAF Corporation. N-substituted-p-(2-chloroethyl)-phosphonamidates as yield improvers. 3,928,018, Cl. 71-86.000.

Randerson, Keith, to British Steel Corporation. Heat treatment of steel. 3,928,090, Cl. 148-134.000.

Randlett, Myron R.: *See—*
Harvey, Walter W.; Randlett, Myron R.; and Bangerskis, Karlis L., 3,928,152.

Rank Xerox Ltd.: *See—*
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Ransburg Corporation: *See—*
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Rantanen, Lasse: *See—*
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Raschke, Herbert A., to E. D. Bullard Company. Dual purpose air inlet method for head enclosure. 3,927,668, Cl. 128-142.700.

Rau, Karlheinz: *See—*
Baumler, Peter; Hofer, Gerhard; Korner, Tassilo; Mohn, Heinrich; Seiler, Karl; Simmat, Fritz; and Rau, Karlheinz, 3,927,697.

Raubenheimer, Johann Nicolaas, to Peacock Investments (Proprietary) Limited. Apparatus for cleaning the surface of a liquid. 3,928,202, Cl. 210-169.000.

Rauch, Erwin I. Lawn plugger. 3,927,720, Cl. 172-22.000.

Raun, Arthur P., to Eli Lilly and Company. Ruminant feed utilization improvement. 3,928,571, Cl. 424-118.000.

Rauschenfels, Eberhard: *See—*
Schmitt-Henco, Carl Heinrich; and Rauschenfels, Eberhard, 3,928,058.

Ravani, Chandrakant Dhanjibhai: *See—*
Skeltis, Anthony John; Rostafinski, Jaroslaw Joseph; and Ravani, Chandrakant Dhanjibhai, 3,927,621.

Raymond, Jean-Louis. Universal engraving machine. 3,927,599, Cl. 90-13.200.

Raymond Lee Organization, Inc., The: *See—*
de Figueiredo, Antonio M. C., 3,927,532.
Detoia, Vincent D., 3,927,896.
Ferguson, Laureen M., 3,927,595.
Lopsadhayoodh Prasert, 3,928,737.
Zawislak, Phyllis D., 3,927,894.

Razziano, Margot, to Blum Folding Paper Box Co., Inc. Self-erecting box. 3,927,824, Cl. 229-37.00R.

RCA Corporation: *See—*
Clark, Robert John, 3,928,845.
Evans, Wayne Wheeler, 3,928,808.

Redmond, John Peter; Andrews, Daniel Marshall; Brooks, Charles Parsons; Cinalli, Dominic A.; and Merlina, Joseph Francis, to AMP Incorporated. Modified hectorite for electroless plating. 3,928,663, Cl. 427-304.000.

Reed, Alan Brydon; and May, William Stanley, to Imperial Chemical Industries Limited. Stopping internal combustion engines. 3,927,656, Cl. 123-198.00D.

Reed Paper Group Limited: *See—*
Brailsford, Sidney Frank; and McDonald, Donald Robson, 3,928,055.

Reese, Johannes; and Kraft, Kurt, to Hoechst Aktiengesellschaft. N,N'-Substituted 2,4,5-triketoimidazolidines. 3,928,376, Cl. 260-309.500.

Regel, Erik: *See—*
Draber, Wilfried; Buchel, Karl Heinz; Regel, Erik; and Plempel, Manfred, 3,928,348.

Regensburger, Paul J., to Xerox Corporation. Electron transport layer over an inorganic photoconductive layer. 3,928,034, Cl. 96-1.500.

Reichenbacher, Paul H., to Universal Oil Products Company. Preparation of unsaturated-hydrocarbyl coumaryl ethers. 3,928,388, Cl. 260-343.200.

Reid, Laurie M., to Master Packaging Equipment, Inc. Packaging apparatus. 3,927,507, Cl. 53-182.000.

Reilly, Charles B.; and Rossi, Robert K., to Goodyear Tire & Rubber Company, The. Hydantoin produced polyurethane. 3,928,289, Cl. 260-75.0NQ.

Reime, Roy O., to Dorst, Richard. Suspension system for electrically powered vehicle. 3,927,728, Cl. 180-60.000.

Reimers, James L.; and Miller, Rodney D., to FMC Corporation. Containerized hydrostatic sterilizing system. 3,927,976, Cl. 21-80.000.

Reinecke, Erich, to WABCO Westinghouse GmbH. Axle generator device having deflectable stator. 3,928,802, Cl. 324-174.000.

Reinhard, Ruedi. Pile carpet and a process for its manufacture. 3,928,694, Cl. 428-92.000.

Reinke, Friedhelm: *See—*
Seulen, Gerhard; Reinke, Friedhelm; and Stengel, Edgar, 3,927,870.

Reisser, Fritz: *See—*
Milzner, Karlheinz; and Reisser, Fritz, 3,928,353.

Reitemeier, Arthur L.: *See—*
Dowell, Arthur M., Jr.; and Reitemeier, Arthur L., 3,928,653.

Rekawek, Janusz J., to Bennett, Darel. Apparatus to facilitate joining pipe sections together to form a vertical pipe column. 3,927,770, Cl. 214-1.00P.

Remund, Werner, to Buhler Brothers, Ltd. Transfer mechanism for long dried farinaceous products. 3,927,756, Cl. 198-27.000.

Renard, Lucien Paul: *See—*
Philippe, Leon Jean; Defraye, Rene Charles; and Renard, Lucien Paul, 3,927,558.

Renault, Philippe: *See—*
Deschamps, Andre; Renault, Philippe; and Dezael, Claude, 3,928,548.

Renfroe, Harris Burt, to Ciba-Geigy Corporation. 3-Aroyl-alkenyleneimines in treating inflammation. 3,928,614, Cl. 424-263.000.

Renth, Ernst Otto; Schromm, Kurt; Mentrup, Anton; and Danneberg, Peter, to Boehringer Ingelheim GmbH. Piperazine derivatives. 3,928,358, Cl. 260-268.0BC.

Resag, Klaus: *See—*
Greve, Heinz Gunter; and Resag, Klaus, 3,928,415.

Research Engineering Co.: *See—*
Sheesley, John M.; and Gulick, Ronald A., 3,927,573.

Reuter, Henry G.: *See—*
Bolsenga, Stanley J.; Kotow, Stephen S.; Reuter, Henry G.; and Volante, Donald J., 3,927,878.

Reuter, Martin; and Rupp, Walter, to Hoechst Aktiengesellschaft. Process for the preparation of tertiary methyl-phosphine oxides. 3,928,463, Cl. 260-606.50P.

Reynolds, Clarke; and Quigley, Richard J. Third rail cover board. 3,927,742, Cl. 191-30.000.

Reynolds, James S.: *See—*
Cohn, Alfred; and Reynolds, James S., 3,927,688.

Rhodes, John R.: *See—*
Clausen, Kermit D.; and Rhodes, John R., 3,928,766.

Rhodes, Philip H.; and Ahr, Robert L., to Emery Industries, Inc. Liquid stabilizer system for polyvinyl chloride. 3,928,267, Cl. 260-23.0XA.

Rhone Poulenc: *See—*
Viannay, Stephane; and Sausse, Andre, 3,927,981.

Rhone-Poulenc Industries: *See—*
Mercier, Jules, 3,928,459.

Rhone-Poulenc S.A.: *See—*
Brunie, Jean Claude; Costantini, Michel; Crenne, Noel; and Joufret, Michel, 3,928,452.

Rhone-Progil: *See—*
Buoy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,928,167.
Soula, Gerard; Metzger, Jacques; and Lena, Louis, 3,928,470.

Ribka, Joachim, to Hoechst Aktiengesellschaft. γ-Modification of phenyl-azo-naphthol pigment. 3,928,315, Cl. 260-204.000.

Rice, Daniel L., to General Motors Corporation. Indexing mechanism. 3,927,574, Cl. 74-57.000.

Richards, Mildred C.: *See—*
Samour, Carlos M.; and Richards, Mildred C., 3,928,423.

Richardson-Merrell Inc.: *See—*
Grunwell, Joyce F.; and Benson, Harvey D., 3,928,398.

Richmond, Wesley Q.; and Cichy, Paul, to Carborundum Company, The. Semicontinuous process for producing oxide refractory material having fine crystal structure. 3,928,515, Cl. 264-5.000.

Richter, George N.: *See—*
Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., 3,927,998.
Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., 3,928,000.
Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., 3,928,001.

Richtzenhain, Hermann: *See—*
El-Chahawi, Moustafa; and Richtzenhain, Hermann, 3,928,429.

Riebold, Fred A. Automatic in-place stirrup. 3,927,509, Cl. 54-48.000.

Riemenschneider, Wilhelm; Hornig, Lothar Heinz, deceased; by Hornig nee Munich, Anneliese, co-heiress; Meidert, Helmut; and Krekeler, Hans, to Hoechst Aktiengesellschaft. Process for the manufacture of carbon tetrachloride. 3,928,479, Cl. 260-658.00R.

Rigge, Ronald J.; and Carniglia, Stephen C., to Kaiser Aluminum & Chemical Corporation. Alumina catalyst carriers and the process for producing them. 3,928,236, Cl. 252-463.000.

Riggs & Lombard, Inc.: *See—*
Holm, William J., 3,927,814.

Rigler, Lloyd E.; Taki, Ghazi H.; and Spirtos, Nicholas G., to Adolph's Ltd. Thickened food. 3,928,252, Cl. 426-573.000.

Risse, Claude: *See—*
Moreau, Michele; Karadavidoff, Isaac; and Risse, Claude, 3,928,603.

Rissi, Erwin: *See—*
Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, 3,928,360.

Ritola, Edward W., to Lumber Systems, Inc. Sorting apparatus with rotating article diverter. 3,927,755, Cl. 198-25.000.

Rittler, Hermann L.: *See—*
Beall, George H.; Miller, David M.; and Rittler, Hermann L., 3,928,533.

Ritzow, Gerald R.; and Ritzow, Roger C. Aquarium. 3,927,643, Cl. 119-5.000.

Ritzow, Roger C.: *See—*
Ritzow, Gerald R.; and Ritzow, Roger C., 3,927,643.

Robert, Andre, to Upjohn Company, The. Method of reducing the undesirable gastrointestinal effects of prostaglandin synthetase inhibitors. 3,928,588, Cl. 424-234.000.

Robert Bosch G.m.b.H.: *See—*
Esper, Friedrich J.; Friese, Karl-Hermann; and Pollner, Rudolf, 3,928,837.
Kiencke, Uwe; and Honig, Gunter, 3,928,797.
Stumpp, Gerhard, 3,927,649.

van der Kolk, Hans-Jurgen; Mindner, Reinhard; Kiess, Tilman; Muhlich, Peter; Aldinger, Ulrich; and Adler, Karl-Heinz. 3,927,528.

Robertsson, Hans R., to Saab-Scania Aktiebolag. Gunnery training scoring system with laser pulses. 3,927,480, Cl. 35-25.000.

Robin, Allen M.: *See—*
Child, Edward T.; and Robin, Allen M., 3,927,997.
Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., 3,927,998.
Child, Edward T.; and Robin, Allen M., 3,927,999.
Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., 3,928,000.
Child, Edward T.; Robin, Allen M.; Slater, William L.; and Richter, George N., 3,928,001.

Robinson, William H., to Buckeye Molding Co. Molded article. 3,927,795, Cl. 220-269.000.

Robison, William G.; and Bieker, Ronald D., to Ag-Chem Equipment Co., Inc. Horizontal boom lift arms. 3,927,832, Cl. 239-168.000.

Robusto, Paul F.; and Stephens, Craig P., to Hughes Aircraft Company. Process for fabricating a solid state, thin film field sustained conductivity device. 3,928,671, Cl. 427-88.000.

Rochat, Alain Claude; and Stocker, Emil, deceased (by Stocker-Boller, Heidi, legal representative), to Ciba-Geigy AG. One step process of preparing azo dyes by simultaneous diazotization and coupling at low pH. 3,928,314, Cl. 260-203.000.

Rochat, Alain Claude: *See—*
Spaun, Rudiger; Rochat, Alain Claude; Gallay, Jean-Jacques; and Brenneisen, Paul, 3,928,437.

Roche, Alain Y. Synchronization device for time-multiplexed signal transmission and switching systems. 3,928,727, Cl. 179-15.0BS.

Rochling, Hans; Hartel, Kurt; and Kirsch, Reinhard, to Hoechst Aktiengesellschaft. Bis-triazinobenzimidazoles and their preparation. 3,928,345, Cl. 260-249.500.

Rockwell, Edward A. Skid control system components. 3,927,913, Cl. 303-6.00C.

Rockwell International Corporation: *See—*
Hamilton, C. Howard; and Ascani, Leonard A., Jr., 3,927,817.
Tucker, Jerry, 3,928,101.
Volpe, Richard Louis, 3,927,699.

Roder, Kurt: *See—*
Nusslein, Ludwig; Roder, Kurt; and Pieroh, Ernst Albrecht, 3,928,615.

Roeck, Werner Wilhelm. Apparatus for use in the determination of focal spot size in X-ray tubes. 3,928,767, Cl. 250-320.000.

Roehner, Soll. Helix of a series of discarded vehicle tires. 3,928,701, Cl. 428-222.000.

Roesser, James R.: *See—*
Jones, Roger W.; Fineman, J. C.; and Roesser, James R., 3,927,752.

Rogers, Ivor Thomas, to George Kent, Limited. Methods of fitting fluid pressure operated devices into pipelines. 3,927,451, Cl. 29-157.00R.

Rogg, Herman O.: *See—*
Martin, Harold B.; and Rogg, Herman O., 3,927,596.

Rogic, Milorad M.; and Mares, Frantisek, to Allied Chemical Corporation. Synthesis of 2-halo-5-cyano alkyl valerate. 3,928,445, Cl. 260-566.00A.

Rohm & Haas Company: *See—*
Bayer, Horst O.; Swithenbank, Colin; and Yih, Roy Y., 3,928,416.

Rohr, Carl A.: *See—*
Hugoson, Birger O.; and Rohr, Carl A., 3,927,521.

Roland Corporation: *See—*
Morita, Masanori, 3,927,594.

Roman, Robert J., to Eastman Kodak Company. Film threading device. 3,927,847, Cl. 242-192.000.

Romans, Duane R., to Farmland Industries, Inc. Additive composition for spark-ignition engine fuels. 3,927,994, Cl. 44-63.000.

Romans, Duane R., to Farmland Industries, Inc. Additive composition for compression-ignition engine fuels. 3,927,995, Cl. 44-63.000.

Rongved, Leif: *See—*
Brady, Kevin James; Firtion, Victor Andrew; Rongved, Leif; and Saunders, Thomas Edward, 3,927,939.

Ronson Products Limited: *See—*
Kolodziej, Alojzy Antoni, 3,927,581.

Ropers, Johann: *See—*
Schabert, Hans-Peter; Ropers, Johann; and Strickroth, Erich, 3,928,133.

Rosalsky, Ivan, to Airlite Aluminum Corporation. Method of making metal ball-bat. 3,927,466, Cl. 29-511.000.

Rosati, Robert L., to Pfizer Inc. Malonyl derivatives of 6-(α-aminoacylamido)penicillanic acids. 3,928,324, Cl. 260-239.100.

Rosch, Gunter: *See—*
Sahm, Wilfried; and Rosch, Gunter, 3,928,390.

Rose, John Brewster, to Imperial Chemical Industries Limited. Aromatic polymers containing ketone linking groups and process for their preparation. 3,928,295, Cl. 260-79.30M.

Rosen, Harry, to American Home Products Corporation. Hyperglycemia therapy. 3,928,597, Cl. 424-273.000.

Rosenberg, Ira, to Clairol Incorporated. Method for coating human nails. 3,928,113, Cl. 156-344.000.

Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Preparation of 3-oxo-19-nor-Δ^4-steroids from 10-[3-substituted-alkyl]-desasteroids. 3,928,446, Cl. 260-566.0AE.

Rosenberger, Paul C.: *See—*
Prillinger, Peter F. M.; and Rosenberger, Paul C., 3,927,737.

Rosenblum, Saul A.: *See—*
Garcia, Fe, 3,927,672.

Rosenkranz, Hans Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, to Bayer Aktiengesellschaft. Polymers which contain urethane groups and which are cross-linkable by vinyl polymerisation. 3,928,299, Cl. 260-89.50N.

Rosquist, Gerald L. Vertical adjustable collapsible seat. 3,927,911, Cl. 297-15.000.

Rossi, Alberto: *See—*
Haas, Georges; Sallmann, Alfred; and Rossi, Alberto, 3,928,363.

Rossi, Robert K.: *See—*
Reilly, Charles B.; and Rossi, Robert K., 3,928,289.

Rostafinski, Jaroslaw Joseph: *See—*
Skeltis, Anthony John; Rostafinski, Jaroslaw Joseph; and Ravani, Chandrakant Dhanjibhai, 3,927,621.

Rotex, Inc.: *See—*
Lower, William E.; and Ivan, Edward K., 3,928,189.

Rothkegel, Bernhard; and Schreiner, Horst, to Siemens Aktiengesellschaft. Two-part sintered electrical contact. 3,927,990, Cl. 29-191.000.

Roussel Uclaf: *See—*
Taylor, John Bodenham; and Harrison, Derek Ralph, 3,928,354.

Rowe, Charles S., deceased (by Rowe, Doris D., executrix); and Pyles, Alvin C., to Rowe, Doris D., a part interest. Lubricant and cleaning composition for precision instruments. 3,928,218, Cl. 252-49.600.

Rowe, Doris D.: *See—*
Rowe, Charles S., deceased; and Pyles, Alvin C., 3,928,218.

Rowe, Doris D., executrix: *See—*
Rowe, Charles S., deceased; and Pyles, Alvin C., 3,928,218.

Rowe, Stephen Henry; Bass, John Charles; and Goodfellow, Robert Charles, to Plessey Handel und Investments A.G. Joining optical waveguides. 3,928,102, Cl. 156-158.000.

Rowland, Colin Mostyn: *See—*
Chandra, Grish; and Rowland, Colin Mostyn, 3,928,629.

Rowland-Hill, Edward W., to Sperry Rand Corporation. Concave for an axial flow threshing and separating machine. 3,927,678, Cl. 130-27.00T.

Royal Industries, Inc.: *See—*
Baker, Charles J., 3,927,724.

Rubino, Andrew M.: *See—*
Jones, John L.; Rubino, Andrew M.; and Lindahl, Charles B., 3,928,545.

Rubinstein, Morton K. Latching mechanism for portable security container. 3,927,741, Cl. 190-61.000.

Rudloff, Bernard. Composite article of fibers and resins. 3,928,693, Cl. 428-74.000.

Rudolph, Hans: *See—*
Dhein, Rolf; Kaiser, Bernd-Ulrich; Rudolph, Hans; Kuchenmeister, Rolf; and Niehaus, Clemens, 3,928,265.
Rosenkranz, Hans Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, 3,928,299.

Rudzik, Allan D.: *See—*
Friis, Walter, Jr.; and Rudzik, Allan D., 3,928,589.

Rule, Clinton, to Rule Industries, Inc. Fluid-tight flexible cover. 3,928,742, Cl. 200-302.000.

Rule Industries, Inc.: *See—*
Rule, Clinton, 3,928,742.

Rupp, Walter: *See—*
Reuter, Martin; and Rupp, Walter, 3,928,463.

Russell, James P., to Winter Products Co. Electroplating recovery process. 3,928,146, Cl. 204-14.00R.

Russell, Peter B.: *See—*
Yardley, John P.; and Russell, Peter B., 3,928,626.

Russell, Ralph T.: *See—*
Hubert, Alfred W.; and Russell, Ralph T., 3,928,642.

Russell, Robert H.; and Wolff, Allan L., to Physiological Electronics Corporation. Method and apparatus for detecting cardiac arrhythmias. 3,927,663, Cl. 128-2.06A.

Rutgerswerke Aktiengesellschaft: *See—*
Jellinek, Karl; and Oellig, Rudi, 3,928,287.
Miele, Heinrich; Orth, Winfried; and Pastorek, Emmerich, 3,928,472.

Ryan, William F.: *See—*
Struttmann, Donald R.; and Ryan, William F., 3,927,694.

Ryan, William P.: *See—*
Donovan, Timothy F.; and Ryan, William P., 3,927,753.

Rychnovsky, Raymond E., to United States of America, Energy Research and Development Administration. Lifting parachute. 3,927,850, Cl. 244-145.000.

Rydh, Thore Oskar Verner: *See—*
Dahlberg, Alf-Goran; Hogberg, Karl Gustav; Lindvall, Sven; and Rydh, Thore Oskar Verner, 3,928,581.

S.A.E.S. Getters S.p.A.: *See—*
Zucchinelli, Mario, 3,927,953.

S.S.B. Industries, Inc.: *See—*
Klein, Jack, 3,927,544.

Saab-Scania Aktiebolag: *See—*
Robertsson, Hans R., 3,927,480.

Sacrini, Egeo; and Cavallotti, Claudio, to B.F. Goodrich Company, The. Organic peroxides, their preparation, and their applications. 3,928,464, Cl. 260-610.00R.

Sacrini, Egeo; and Cavallotti, Claudio, to B. F. Goodrich Company, The. Organic peroxides, their preparation, and their applications. 3,928,465, Cl. 260-610.00R.

Sacrini, Egeo; and Cavallotti, Claudio, to B. F. Goodrich Company, The. Organic peroxides derived from unsaturated compounds. 3,928,466, Cl. 260-610.00R.

Sacrini, Egeo; and Cavallotti, Claudio, to B.F. Goodrich Company, The. Organic peroxides, their preparation and their applications. 3,928,467, Cl. 260-610.00R.

Safranek, Nathan N. Portable collapsible partition for a table. 3,927,481, Cl. 35-60.000.

Saft-Societe des Accumulateurs Fixes et de Traction: *See*—
Gerbier, Gerard; and Depoix, Pierre, 3,928,072.
Sperandio, Francis; and Leturque, Michel, 3,928,069.
Sperandio, Francis; and Guglieri, Michel, 3,928,077.

Sagae, Syoji; and Doi, Tetsuo, to Hitachi, Ltd. Image reproducing system. 3,928,718, Cl. 178-6.60R.

Sahara, Hajime: *See*—
Orito, Zen-ichi; Uchida, Minoru; Takesue, Masatoshi; Sahara, Hajime; and Fujii, Kihiro, 3,928,528.

Sahm, Wilfried; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Certain 2-substituted phenyl and substituted naphthyl benzofurans. 3,928,390, Cl. 260-346.20R.

Sailor, Robert A.: *See*—
Davis, Francis E., Jr.; Graven, Richard G.; Lee, Wooyoung; and Sailor, Robert A., 3,928,172.

Saint-Gobain Industries: *See*—
Sauer, Gerd, 3,928,748.

Saintier, Francois Rene Andre, to Singer Company, The. Sewing machine attachment to carrying case base. 3,927,630, Cl. 112-217.100.

Sainz, Raul T.: *See*—
Harrison, David; and Sainz, Raul T., 3,927,833.

Saito, Hiroshi: *See*—
Kobayashi, Kazuhiro; Saito, Hiroshi; Ogawa, Yukio; Yoshida, Koki; and Kondo, Isamu, 3,927,454.

Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; Yaguchi, Kunihide; Kodama, Kenji; and Miyamori, Tamotsu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method of removing sulfur dioxide from combustion exhaust gas. 3,928,537, Cl. 423-243.000.

Sakai-Chemical Industry Company, Ltd.: *See*—
Konishi, Kenzo; Kotone, Akira; Nakane, Yoshihiko; Hori, Takeshi; and Hoda, Masahiro, 3,928,310.

Sakai, Hiroshi: *See*—
Dycke, Norbert; and Sakai, Hiroshi, 3,927,549.

Sakai, Yasuo: *See*—
Yamamura, Katsumi; Harigaya, Hiroshi; and Sakai, Yasuo, 3,928,085.

Sakamaki, Hisashi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 3,927,936.

Sakamoto, Kenshi: *See*—
Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, 3,928,635.

Sakaue, Fukumatsu, to Fugi Xerox Co., Ltd. Vacuum evaporation plating apparatus. 3,927,638, Cl. 118-49.100.

Sakurada, Nobuaki; Nakamoto, Soichi; Ito, Tadashi; Ito, Fumio; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. System for setting photographing conditions. 3,928,858, Cl. 354-23.00D.

Salamon, Manfred: *See*—
Wandel, Martin; Salamon, Manfred; Dornheim, Gotz Gotmar; and Kuhlmann, Bernard, 3,928,696.

Salle, Robert: *See*—
Cohen, Choua; Durif-Varambon, Bruno; Salle, Robert; and Sillion, Bernard, 3,928,290.

Sallmann, Alfred: *See*—
Haas, Georges; Sallmann, Alfred; and Rossi, Alberto, 3,928,363.

Salzer, Erwin; and Kozacka, Frederick J., to Chase-Shawmut Company, The. Composite fuse holders. 3,927,927, Cl. 339-125.00R.

Samans, Robert: *See*—
Schonfeld, Wolfram; Philipps, Armin; Eversberg, Hans; Hausler, Karl-Heinz; and Samans, Robert, 3,927,547.

Sammaritano, Michael. Positive sub-surface utility line and the like indicator. 3,927,637, Cl. 116-114.00R.

Sammet, Aaron F., to Martin Farms Partnership; and Joan of Arc Company, part interest to each. Selective asparagus harvesting unit. 3,927,514, Cl. 56-327.00A.

Samour, Carlos M.; and Richards, Mildred C., to Kendall Company, The. Monomeric emulsion stabilizers. 3,928,423, Cl. 260-482.00P.

Samuelsson, Mokjas Erik Samuel, to Finmekano Erik Samuelsson AB. Device for straightening deformed vehicles or vehicle parts. 3,927,550, Cl. 72-447.000.

Sanda, Joseph C., Jr., to Firestone Tire & Rubber Company, The. Tire treads and their production. 3,928,291, Cl. 260-75.00R.

Sandblom, Sven O.: *See*—
Gudmestad, Ragnar; and Sandblom, Sven O., 3,927,590.

Sandoz, Inc.: *See*—
Griot, Rudolf G., 3,928,449.

Sandoz Ltd.: *See*—
Ebnother, Anton; Bastian, Jean-Michel; and Rissi, Erwin, 3,928,360.
Fleck, Fritz; Schmid, Horst; Mercer, Alec Victor; and Paver, Roger, 3,928,329.
Hoger, Kurt; and Tscheulin, Guenther, 3,928,510.
Milzner, Karlheinz; and Reisser, Fritz, 3,928,353.

Sansone, Ronald P., to Pitney-Bowes, Inc. Omnidirectional scanner for reading digitally encoded tickets. 3,928,759, Cl. 250-568.000.

Sarisky, James Edward: *See*—
Mullersman, Ferdinand Henry; and Sarisky, James Edward, 3,928,792.

Sarring, Ernest J., to Xerox Corporation. T-bar actuated bookbinder. 3,928,117, Cl. 156-477.00B.

Sarring, Ernest J., to Xerox Corporation. Bookbinding machine. 3,928,119, Cl. 156-477.00B.

Sartre, Bernard: *See*—
Buoy, Pierre; Masure, Daniel; Collon, Paul; Pigeaud, Jean-Marie; and Sartre, Bernard, 3,928,167.

Sasabe, Kaoru; Kotera, Hiroaki; Hane, Toshihide; and Kihara, Nobuyoshi, to Matsushita Electric Industrial Co., Ltd. Image display system. 3,928,719, Cl. 178-6.800.

Sasaki, Rinzo: *See*—
Okuno, Toshio; and Sasaki, Rinzo, 3,928,025.

Sato, Akira: *See*—
Nakazawa, Yoshiyuki; Nakamura, Yashuharu; Nakajima, Yosuke; Matsuyama, Junichi; and Sato, Akira, 3,928,856.

Sato, Masatoshi; Umemura, Katuo; and Kamata, Yoshinori, to Tokyo Shibaura Electric Co., Ltd. Packaging unit. 3,927,767, Cl. 206-521.000.

Sato, Mitsuyoshi: *See*—
Niitai, Itaru; Kaneko, Yasuhisa; Morita, Akiyoshi; Nemoto, Yasuo; and Sato, Mitsuyoshi, 3,928,241.

Sato, Tsutomu; Deura, Hiroshi; and Oba, Kenkichi, to Lion Fat & Oil Co., Ltd. Method of treating waste plastics. 3,928,268, Cl. 260-23.00H.

Sato, Yoshinari: *See*—
Umio, Suminori; Ueda, Ikuo; Sato, Yoshinari; and Maeno, Shizuo, 3,928,356.

Satoh, Hirokazu; Takeuchi, Hidesato; and Oikawa, Shigeki, to Onoda Chemical Industry Company, Limited. Method for continuously producing hydrated calcium silicates. 3,928,539, Cl. 423-326.000.

Satoh, Ryosuke: *See*—
Fujiwhara, Mitsuto; Endo, Takaya; Satoh, Ryosuke; Masukawa, Toyoaki; and Uozumi, Takahiro, 3,928,041.

Saucy, Gabriel: *See*—
Olson, Gary Lee; and Saucy, Gabriel, 3,928,400.
Rosenberger, Michael; and Saucy, Gabriel, 3,928,446.

Sauder Industries, Inc.: *See*—
Sauder, Robert A.; and Kendrick, Gary R., 3,928,097.

Sauder, Robert A.; and Kendrick, Gary R., to Sauder Industries, Inc. Process and machine for manufacturing insulation modules. 3,928,097, Cl. 156-213.000.

Sauer, Gerd, to Saint-Gobain Industries. Combined window heater and antenna. 3,928,748, Cl. 219-522.000.

Sauer, Winfriede: *See*—
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Saunders, Peter Anthony; Fox, Michael Frank; Fagan, Anthony Francis; and Derbyshire, Philip Edward, to Edwin Cooper & Company. Preparation of overbased magnesium lubricant additives. 3,928,216, Cl. 252-33.400.

Saunders, Thomas Edward: *See*—
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Sawyer, Philip Nicholas. Prosthesis and method for making same. 3,927,422, Cl. 3-1.000.

Sawyer, Philip Nicholas. Method of conditioning vascular systems by administering 3,5 dichloroaspirin and method of evaluating pharmaceutical compounds. 3,928,587, Cl. 424-230.000.

Sazonov, Alexandr Afanasievich: *See*—
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Schabert, Hans-Peter; Ropers, Johann; and Strickroth, Erich, to Siemens Aktiengesellschaft. Biological shield for a nuclear reactor. 3,928,133, Cl. 176-87.000.

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Schafer, Horst, to SEMIKRON Gesellschaft fur Gleichrichterbau und Electronik m.b.H. Glass forming mixture with boron as the doping material for producing conductivity zones in semiconductor bodies by means of diffusion. 3,928,225, Cl. 252-182.000.

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Schlosser, Donald K.; Myers, Lewis P.; and Caton, Robert L., to Carpenter Technology Corporation. Ferritic stainless steel. 3,928,088, Cl. 148-37.000.

Schmall, Karl Heinz, to Precitec GmbH. Regulating process and device. 3,928,790, Cl. 318-286.000.

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Schmitt-Henco, Carl Heinrich; and Rauschenfels, Eberhard, to Dyckerhoff Zementwerke A.G. Expanded synthetic calcium silicates. 3,928,058, Cl. 106-306.000.

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Schwarz, Frank, to United States of America, Energy Research and Development Administration. Intrusion detector self-test system. 3,928,849, Cl. 340-410.000.

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Skarek, Jiri: *See—*
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Slusarczuk, George M. J., to General Electric Company. Preparation of hydrocarbon-dispersible magnetic microspheroids in powdered form. 3,928,220, Cl. 252-62.620.

Smith, Claude A.; Taylor, David E.; and Williams, Donald L., to General Motors Corporation. Exhaust gas recirculation valve. 3,927,650, Cl. 123-119.00A.

Smith, Dennis B. Culture chamber for the study of biological systems and method of fabrication thereof. 3,928,142, Cl. 195-104.000.

Smith, Franklin G.; and Wilson, Gerald M., to Northwest Marine Products, Inc. Remote control drain valve. 3,927,860, Cl. 251-299.000.

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Smith, Leslie Harold, to Imperial Chemical Industries Limited. 1-Aryloxy-3-ureidoalkylamino-2-propanols. 3,928,412, Cl. 260-465.00D.

Smith, Malcolm Kent; and White, Robert Winslow, to N L Industries, Inc. Composition and method for inhibiting asbestos fiber dust. 3,928,060, Cl. 106-308.00Q.

Smith, Richard E., to Xerox Corporation. Developer shut-off apparatus. 3,927,640, Cl. 118-637.000.

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Soloviev, Vladimir Pavlovich; Kafarov, Viktor Vyacheslavovich; Schus, Alexandr Grigorievich; and Stulnikov, Gennady Pavlovich. Wet grinder. 3,927,838, Cl. 241-46.150.

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Soula, Gerard; Metzger, Jacques; and Lena, Louis, to Rhone-Progil. Preparation of 2-nitrohalophenols. 3,928,470, Cl. 260-622.00R.

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Speakman, Peter Roscoe Hartley, to Procter & Gamble Company, The. Photoactivated bleaching process and composition. 3,927,967, Cl. 8-103.000.

Speedie, Robert, to Illinois Tool Works Inc. Regulator apparatus. 3,927,577, Cl. 74-567.000.

Spence, Gary W., to CPT Corporation. Fast scan electronic circuit with contact bounce elimination for an automatic typing system keyboard. 3,928,847, Cl. 340-365.00E.

Sperandio, Francis; and Leturque, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Method for cutting out substantially rectangular electrodes from a continuous band obtained by said method and cells embodying said electrodes. 3,928,069, Cl. 136-75.000.

Sperandio, Francis; and Guglieri, Michel, to Saft-Societe des Accumulateurs Fixes et de Traction. Casing for an electrochemical cell having small bulk. 3,928,077, Cl. 136-111.000.

Sperber, Heinrich: *See—*
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Spiegel, William; Spiegel, Jacob; and Miller, Albert, to Gilbreth Company. Die-cut coupon shrink label. 3,927,484, Cl. 40-307.000.

Spier, I. Martin; and Vener, Frank B. Anti-friction release plate. 3,927,895, Cl. 280-11.35C.

Spindel, Robert C.; and Porter, Robert P., to United States of America, Navy. Tracking system for underwater objects. 3,928,840, Cl. 340-6.00R.

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Sprinter Pack AB: *See—*
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Stadler, Paul A.; Eschenmoser, Albert; and Sundt, Erling, to Firmenich S.A. Perfume composition including oxygenated decalin derivatives. 3,928,246, Cl. 252-522.000.

Stahl, Howard D.; and Sims, Rex J., to General Foods Corporation. Method and composition for low ph whipped toppings. 3,928,648, Cl. 426-564.000.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Machine for continuous spinning by means of spinning rotors. 3,927,516, Cl. 57-58.890.

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Standaart, Adrian W. Single gun, multi-screen, multi-beam, multi-color cathode ray tube. 3,928,785, Cl. 313-411.000.

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Steeg, Joachim, to Dr.-Ing. Max Schloetter. Weak acidic bright ductile zinc electrolyte. 3,928,149, Cl. 204-55.00R.

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Steiger, Douglas W. Safety lock device for the control levers of a front end loader. 3,927,776, Cl. 214-140.000.

Steigerwald, Robert L., to General Electric Company. Turn-off circuit for gate turn-off thyristors and transistors using snubber energy. 3,928,775, Cl. 307-252.00C.

Stein, Thomas R.: *See—*
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Stogmuller, Heinz, to Vorkauf, Heinrich. Heat exchanger arrangement. 3,927,714, Cl. 165-82.000.

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Stolzer, Claus; and Hammann, Ingeborg. S-(n-acyl-n-alkyl or phenylamidocarbonyl)-methyl-thio-phosphoric and- -phosphonic acid esters. 3,928,508, Cl. 260-943.000.

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Strenglein, Harry F., to Sperry Rand Corporation. Calorimetric resistance bridges. 3,928,800, Cl. 324-106.000.

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Struben, Francis L., to Silver Top Manufacturing Co. Inc. Tensionable hold-down anchorage apparatus. 3,927,494, Cl. 52-23.000.

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Suda, Hideaki; Kotera, Norio; and Hasegawa, Shinichi, to Sumitomo Chemical Company, Limited. Method for the separation of 5-isopropyl-m-cresol. 3,928,471, Cl. 260-627.00G.

Suematsu, Yasuo; Miyazaki, Ryuhei; Kubo, Mitsuyasu; Uotani, Tsuyoshi; and Uchida, Hironori, to Shinto Paint Co., Ltd.; and Uyemura & Co., Ltd. Cathodic treatment of chromium-plated surfaces. 3,928,157, Cl. 204-181.000.

Suggitt, Robert M., to Texaco Inc. Preparation of polyphenyls. 3,928,481, Cl. 260-668.00D.

Suggitt, Robert M., to Texaco Inc. Production of aromatic compounds by oxidative dehydrogenation. 3,928,484, Cl. 260-668.00D.

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Suzuki, Hideaki; Togawa, Haruo; Omori, Akira; and Yamamoto, Naoki, to Teijin Limited. Process for producing an ion-exchangeable and solvent-resistant filamentary structure. 3,927,968, Cl. 8-115.500.

Suzuki, Hideo: *See—*
Kato, Katsuhiro; Suzuki, Hideo; and Yano, Norio, 3,928,828.

Suzuki, Shyuichi: *See—*
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Svennberg, Stig Erik: *See—*
Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erik, 3,928,061.

Swanson, Alfred B. Patellar implant and method. 3,927,423, Cl. 3-1.910.

Sweeney, William A.: *See—*
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Sweger, Ulf Allan, to Novitas Nuprot SA. Non-stinging wound dressing containing tertiary butyl alcohol. 3,928,556, Cl. 424-45.000.

Swered, Paul: *See—*
Brink, Robert H., Jr.; Shema, Bernard F.; and Swered, Paul, 3,928,198.

Swiss Aluminum Ltd.: *See—*
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Swithenbank, Colin: *See—*
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Syntex (U.S.A.) Inc.: *See—*
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Syntex (U.S.A.) Inc.: *See—*
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Kapolyi, Laszlo; Kubovits, Imre; Kaszanitzky, Ferenc; and Szabo, 3,928,047.

Szuhaj, Bernard F. Pan release product and process. 3,928,056, Cl. 106-243.000.

Tabler, Donald C.: *See—*
Farha, Floyd E., Jr.; Johnson, Marvin M.; and Tabler, Donald C., 3,928,389.

Tabushi, Iwao; and Fukunishi, Koji, to Idemitsu Kosan Co., Ltd. Process of producing alkyl adamantanes. 3,928,480, Cl. 260-666.00M.

Tachi, Seiichi; and Moriyama, Hideki, to Hitachi, Ltd. Method for manufacturing a semiconductor device utilizing selective oxidation. 3,928,091, Cl. 148-175.000.

Tachibana, Shinro: *See—*
Uchiyama, Mikio; Tachibana, Shinro; Araki, Kengo; and Nakamura, Takafumi, 3,928,306.

Tacussel, Maurice. V-type directional antenna. 3,928,854, Cl. 343-735.000.

Tada, Tetsuya. Sprayer. 3,927,834, Cl. 239-359.000.

Tadokoro, Eiichi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Method for forming protective film by ionic plating. 3,928,159, Cl. 204-192.000.

Tagalakis, Peter: *See—*
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Tai, Wun Ten: *See—*
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Taisho Pharmaceutical Co., Ltd.: *See—*
Kyogoku, Kazuaki; Hatavama, Katsuo; Yokomori, Sadakazu; and Seki, Teruya, 3,928,421.

Takada, Juichiro, legal authorized heir: *See—*
Takada, Takezo, deceased, 3,927,912.

Takada, Takezo, deceased (by Takada, Juichiro, legal authorized heir), to Takata Kojyo Co., Ltd. Automatic braking safety belt reel. 3,927,912, Cl. 297-388.000.

Takahashi, Isoji, to Fuji Photo Film Co., Ltd. Image-forming method. 3,928,669, Cl. 427-19.000.

Takahashi, Kazunori; and Fukasawa, Atsushi, to Oki Electric Industry Company Ltd. Waveguide circulator. 3,928,824, Cl. 333-1.100.

Takahashi, Kazuo: *See—*
Hanai, Ichiro; Takahashi, Kazuo; and Kobayashi, Toshiharu, 3,928,747.

Takahashi, Kiyoshi: *See—*
Fuwa, Masaru; Takahashi, Kiyoshi; Otsuji, Masaaki; and Matsui, Masatake, 3,928,525.

Takahashi, Ryoichi; Hosoi, Takuji; Aiba, Takaaki; and Konno, Tsutomu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Method for manufacturing petroleum pitch having high aromaticity. 3,928,170, Cl. 208-40.000.

Takamizawa, Akira; and Harada, Hiroshi, to Shionogi & Co., Ltd. Aroyl alkyledene thiazolines. 3,928,327, Cl. 260-240.00J.

Takamoku, Kensi: *See—*
Hanado, Masanao; Takamoku, Kensi; Miyoshi, Tsutomu; and Jeng, Shien Tsai, 3,927,726.

Takata Kojyo Co., Ltd.: *See—*
Takada, Takezo, deceased, 3,927,912.

Takata, Yoshinori, to Hitachi, Ltd. Gas flow coulometric detector. 3,928,162, Cl. 204-195.00R.

Takayama, Yuzi; Ichimura, Yutaka; Aoyagi, Takanobu; and Kishino, Takahiro, to Mitsubishi Rayon Co., Ltd. Uniformly pigmented unsaturated polyester resin molded articles. 3,928,254, Cl. 260-2.50B.

Takechi, Hiroshi: *See—*
Gondo, Hisashi; Takechi, Hiroshi; Namba, Kazuo; Usuda, Matsuo; and Kawasaki, Kouichi, 3,928,083.
Takeda, Hiromu; Kobayashi, Takuichi; Oka, Koichiro; and Tanaka, Kazumi, to Toray Industries, Inc. Synthetic fiber for paper and method for producing the same. 3,928,496, Cl. 260-876.00R.
Takeda, Kazuo: *See—*
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Takemura, Yasuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic wave diagnosis apparatus with galvanometer-driven probe. 3,927,661, Cl. 128-2.00V.
Takesue, Masatoshi: *See—*
Orito, Zen-ichi; Uchida, Minoru; Takesue, Masatoshi; Sahara, Hajime; and Fujii, Kihiro, 3,928,528.
Takeuchi, Akitoshi: *See—*
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Tanaka, Kazue; Yamamoto, Katsuo; Nakamura, Hisao; and Wakita, Eiichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Apparatus for continuously heat-treating fibrous materials under pressure. 3,927,540, Cl. 68-5.00E.
Tanaka, Kazumi: *See—*
Takeda, Hiromu; Kobayashi, Takuichi; Oka, Koichiro; and Tanaka, Kazumi, 3,928,496.
Tanaka, Mitsugu: *See—*
Arai, Atsuaki; Oishi, Yasushi; Yamada, Minoru; Yokota, Yukio; Tanaka, Mitsugu; and Inouye, Kozo, 3,928,044.
Tangsrud, Nils; and Devik, Ole Gabriel, to Sintef. Process for dehydrating frozen food particles. 3,928,639, Cl. 426-444.000.
Taniguchi, Kasuyuki: *See—*
Kitayama, Minoru; Taniguchi, Kasuyuki; Kaneta, Kyoichi; and Hirose, Kikuzi, 3,928,048.
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Tanita Corporation: *See—*
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Tao, Fan-Sheng, to Texaco Inc. Emulsion breaking method. 3,928,194, Cl. 210-43.000.
Tarney, Robert Edward; and Verbanc, John Joseph, to Du Pont de Nemours, E. I., and Company. Ozone treatment of elastomers. 3,928,664, Cl. 427-322.000.
Tarshis, Lemuel A.: *See—*
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Tartar, Paul E.: *See—*
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Tate, Jack F., to Texaco Inc. Secondary recovery process utilizing polyvinylpyrrolidones. 3,927,717, Cl. 166-271.000.
Tate, Jack F.; and Maddox, Jim, Jr., to Texaco Inc. Secondary recovery method. 3,927,718, Cl. 166-271.000.
Tausanovitch, Dusan: *See—*
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Lovisa, Peter R.; Tausanovitch, Dusan; and Lovisa, Tullio E., 3,927,857.
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Taylor, Glenn N., to Colgate-Palmolive Company. Quilted diaper. 3,927,673, Cl. 128-287.000.
Taylor, Harold M., to Eli Lilly and Company. Certain substituted 2-pyrazinemethanols. 3,928,352, Cl. 260-250.00B.
Taylor, John Bodenham; and Harrison, Derek Ralph, to Roussel Uclaf. Derivatives of 4(3H)-quinazolone, process of preparation, and pharmaceutical compositions thereof. 3,928,354, Cl. 260-256.40Q.
Taylor, Peter A.; and Su, Tsung-Yuan, to Phillips Petroleum Company. Acid dyeable olefin polymer containing quaternized amine groups. 3,928,269, Cl. 260-23.0AR.
Tedrow, Jack V. Exhaust moisture reduction by prototype heat exchanger. 3,927,526, Cl. 60-320.000.
Tee-Pak, Inc.: *See—*
Dowell, Arthur M., Jr.; and Reitemeier, Arthur L., 3,928,653.
Froehlich, Leonhard H.; and Dowell, Arthur M., Jr., 3,928,651.
Tegtmeyer, Charles John, to North American Instrument Corporation. Lymph duct cannulator and method. 3,927,660, Cl. 128-2.00A.
Teijin Limited: *See—*
Inata, Hiroo; Kawase, Shoji; and Shima, Takeo, 3,928,279.
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Telecommunications Radioelectriques et Telephoniques T.R.T.: *See—*
Bellanger, Maurice Georges; Lepagnol, Guy Pierre; and Daguet, Jacques Lucien, 3,928,755.
Telephone Associates, Inc.: *See—*
Simon, William F.; and Torrey, William C., 3,928,732.
Teller, Steen, to Isotopcentralen. Determining composition of a substance by the use of both reflected and transmitted radiation. 3,928,765, Cl. 250-272.000.
Temple, Kenneth A.: *See—*
Chapman, Rodney M.; and Temple, Kenneth A., 3,927,982.
Temple, Robert Dwight; Heuring, Vincent Paul; and Prentice, James Bruce, to Procter & Gamble Company, The. Fabric softener and soil-release composition and method. 3,928,213, Cl. 252-8.800.
Tennessee Valley Authority: *See—*
Siegel, Milton R.; and Moore, Oscar E., 3,928,015.
Terajima, Yasuhiko, to Fuji Xerox Co., Ltd. Paper feed tray for use with copying machine and the like. 3,927,877, Cl. 271-11.000.
Terry, Michael R., to United States of America, Navy. Method of determining watertight integrity in hovercraft. 3,927,632, Cl. 114-67.00A.
Teske, Fritz; and Teske, Lothar. Apparatus for discharging bulk material from storage tanks. 3,927,774, Cl. 214-17.00D.
Teske, Lothar: *See—*
Teske, Fritz; and Teske, Lothar, 3,927,774.
Tessler, Martin M., to National Starch and Chemical Corporation. Preparation of starch esters. 3,928,321, Cl. 260-233.500.
Teufel, Helmut: *See—*
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Thalen, Bror Arne: *See—*
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Thaler, Warren A.; Buckley, Donald J.; and Kennedy, Joseph P., to Exxon Research and Engineering Company. High molecular weight, high unsaturation isobutylene-conjugated diene copolymers. 3,928,297, Cl. 260-85.30R.
Thibaut, Yves Albert Daniel, to U.S. Philips Corporation. Device for controlling the spin-drying speed in a washing machine. 3,927,541, Cl. 68-12.00R.
Thiel, Max: *See—*
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Thiele, Gerd, to Siemens Aktiengesellschaft. Arrangement for controlling a thyristor. 3,928,776, Cl. 307-252.00N.
Thieme, Klaus: *See—*
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Thierman, I. Bruce. Combination shaft and spool structure. 3,927,687, Cl. 132-92.00A.
Thill, Bruce P.: *See—*
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Thiokol Corporation: *See—*
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Thomas, Arthur S.: *See—*
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Thomas, Frank A. Interconnectors for spiral-wound filtration modules. 3,928,204, Cl. 210-232.000.
Thompson, James A.: *See—*
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Thomson-CSF: *See—*
Couttet, Andre; Dubois, Jean Claude; and Zann, Annie, 3,928,399.

Thornton, J. Scott; and Glowe, Donald E., to Horizons Incorporated. Process for recovery of clean polyester materials. 3,928,253, Cl. 260-2.300.

Thornton, Roy F., to General Electric Company. Hermetically sealed primary battery. 3,928,071, Cl. 136-83.00R.

Thorsnes, John, Jr. Water fowl decoy. 3,927,485, Cl. 43-3.000.

Thurgood, J. Rand; and Clay, Robert B., to Ireco Chemicals. Fine flaked aluminum manufacture. 3,927,836, Cl. 241-19.000.

Tieszen, Dale O., to Phillips Petroleum Company. Crackle finish coating of arylene sulfide polymer containing a fluorocarbon polymer. 3,928,675, Cl. 427-257.000.

Tilak, Bommaraju V.K.S.R.A.: *See*—
Gendron, Aubrey S.; Tilak, Bommaraju V.K.S.R.A.; and Ettel, Victor A., 3,928,153.

Tilles, Harry; and Casida, John E., to Stauffer Chemical Company. Carbamoyl sulfoxide derivatives. 3,928,436, Cl. 260-551.00R.

Tindley, Ronald John, to Gilron Holdings Limited. Cup dispensing device. 3,927,799, Cl. 221-223.000.

Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
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Toa-Throne AB: *See*—
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Tobita, Susumu: *See*—
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Togawa, Haruo: *See*—
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Tolbert, Bert M.: *See*—
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Tomalia, Donald A.; and Thill, Bruce P., to Dow Chemical Company, The. Unsaturated poly(amide-esters) and cross-linked derivatives thereof. 3,928,499, Cl. 260-885.000.

Tomatsu, Toshiharu: *See*—
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Tomba, Charles P.: *See*—
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Tomobe, Tomotsuna: *See*—
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Ton Co., Ltd.: *See*—
Ohta, Ioe; Matsunobu, Akira; Nishizawa, Masafumi; Kubota, Hayato; and Sakamoto, Kenshi, 3,928,635.

Topper, William R.: *See*—
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Toray Industries, Inc.: *See*—
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Takeda, Hiromu; Kobayashi, Takuichi; Oka, Koichiro; and Tanaka, Kazumi, 3,928,496.

Torck, Bernard; Franck, Jean-Pierre; and Derrien, Michel, to Institut Francais du Petrole. Process for isomerizing saturated hydrocarbons. 3,928,488, Cl. 260-683.680.

Torrey, William C.: *See*—
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Toyo Boseki Kabushiki Kaisha (Toyo Spinning Co., Ltd.): *See*—
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Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Trautvetter, Werner: *See*—
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Trenkle, Robert Walter: *See*—
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Treuner, Uwe; and Breuer, Hermann, to E. R. Squibb & Sons, Inc. [[(Alkylthioc arbonyl)oxy]acetyl]cephalosporins. 3,928,335, Cl. 260-243.00C.

Tricker, Keith Arthur. Electronic circuits. 3,927,471, Cl. 29-625.000.

Trinne, John Thomas; and Wilksch, Leslie John. Bottle filling means and method. 3,927,700, Cl. 141-5.000.

Troha, Matthew J.: *See*—
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Tropicana Products, Inc.: *See*—
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Trosclair, Nathaniel D.: *See*—
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Troth, Dennis L.: *See*—
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Bough, Dale E., 3,927,899.
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Tscheulin, Guenther: *See*—
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Tschudi, Dennis E.; and Geordan, Richard H., to Whittaker Corporation. Pulse width control system. 3,928,809, Cl. 328-58.000.

Tsepalova, Nadezhda Alexeevna: *See*—
Berlin, Alfred Anisimovich; Aseeva, Roza Mikhailovna; Mezhikovsky, Semen Markovich; Sherle, Alla Ilinichna; Tsepalova, Nadezhda Alexeevna; Goldovsky, Evgeny Alexandrovich; Zelenetskaya, Tatiana Vladimirovna; Fatkulina, Rozalia Komalovna; and Kuzminsky, Alexandr Samoilovich, 3,928,489.

Tsuchiye, Kimihiro, to Shimano Industrial Company, Limited. Coaster brake for a bicycle. 3,927,743, Cl. 192-6.00R.

Tsuneishi, Norihiro; and Miyabayashi, Yoshiyuki, to Nissan Motor Co., Ltd. Automobile compartment door weatherstrip. 3,927,493, Cl. 49-476.000.

Tsunoda, Tatsui; Oka, Santaro; Miyamoto, Kazuma; Matsumoto, Makoto; and Baba, Heiji, to Kawatetsu Metrological Equipment and Vending Machine Company, Ltd. Automatic cooking and vending machine for boiled noodles. 3,928,045, Cl. 99-330.000.

Tucker, Jerry, to Rockwell International Corporation. Method of fabricating a rolling diaphragm seal. 3,928,101, Cl. 156-156.000.

Tucker, L. Kenneth: *See*—
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Turney, Stephen Z.; Blumenfeld, Walter; Cowley, R. Adams; Wolf, Samuel; McCluggage, Charles; and Ashworth, John W., III. Automatic respiratory gas monitoring system. 3,927,670, Cl. 128-2.070.

Twin Tool, Inc.: *See*—
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UCB Societe Anonyme: *See*—
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Uchigaki, Taku; and Noro, Masataka, to Mitsubishi Petrochemical Co., Ltd. Backing agent for carpet. 3,928,281, Cl. 260-42.390.

Uchiyama, Mikio; Tachibana, Shinro; Araki, Kengo; and Nakamura, Takafumi, to Eisai Co., Ltd. Peptides having xenopsin-like pharmacological activity. 3,928,306, Cl. 260-112.50R.

Uchiyama, Takashi: *See*—
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Uddeholms AB: *See*—
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Ueda, Ikuo: *See*—
Umio, Suminori; Ueda, Ikuo; Sato, Yoshinari; and Maeno, Shizuo, 3,928,356.

Ueda, Yuji: *See*—
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Fujino, Hidekazu; Tanimoto, Kenji; Hosaka, Hirokazu; Ehara, Kazunari; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; and Yasuda, Minoru, 3,928,469.

Ugi, Ivar: *See*—
Hammann, Ingeborg; Hoffmann, Peter; Marquarding, Dieter; Ugi, Ivar; and Unterstenhofer, Gunter, 3,928,408.

Ullmann, Werner; Schumacher, Bernd; Mattei, Silvano; Fenner, Hans-Ueli; and Sieg, Arno, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Spark discharge and electro-chemical erosion machining apparatus. 3,928,163, Cl. 204-206.000.

Umemura, Katuo: *See*—
Sato, Masatoshi; Umemura, Katuo; and Kamata, Yoshinori, 3,927,767.

Umezawa, Hamao; Mitsuhashi, Susumu; Utahara, Ryozo; and Ishikawa, Tetsuo, to Zaidan Hojin Biseibutsu Kagaki Kenkyu Kai. Two substances inhibiting beta-lactamase and their production. 3,928,569, Cl. 424-117.000.

Umezawa, Kazumi: *See*—
Komori, Shigehiro; Sakamaki, Hisashi; Hattori, Hiroyuki; Iida, Toshihide; Miyamoto, Koichi; and Umezawa, Kazumi, 3,927,936.

Umio, Suminori; Ueda, Ikuo; Sato, Yoshinari; and Maeno, Shizuo, to Fujisawa Pharmaceutical Co., Ltd. 10-[4-(ω-Hydroxy alkyl)-1-piperazimyl]-dibenzo (b,f) oxofins and thiepins and acetyl esters thereof. 3,928,356, Cl. 260-268.0TR.

Underhill, Norman R. Clamp for tie rod with stress-relieving means. 3,927,858, Cl. 249-219.00R.

Ungar, Israel S.: *See—*
Wohnhaas, George J.; Ungar, Israel S.; and Scher, Herbert I., 3,928,527.

Union Camp Corporation: *See—*
Giebel, Buddy E., 3,927,822.

Union Carbide Corporation: *See—*
Azrak, Raymond George; Ancker, Fred Harpoth; and Bertolucci, Michael Dean, 3,928,278.
Bakay, Carl James, 3,928,542.
Crockwell, George Warren, 3,927,695.
Grulke, Carl A., deceased, 3,928,529.
Saunby, John Brian, 3,928,434.

Union Insulating Company: *See—*
Kinney, David W.; and Baxter, William E., 3,927,785.

Union Oil Company of California: *See—*
Young, Dean Arthur, 3,928,233.

Uniroyal Inc.: *See—*
Hubbard, Winchester L.; Grahame, Robert E., Jr.; Covey, Rupert A.; and Jancis, Elmar H., 3,928,617.

Unistrut Corporation: *See—*
Papayoti, Hristo V., 3,927,499.

Unitas S.A.: *See—*
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United Kingdom Atomic Energy Authority: *See—*
Lillyman, Ernest; Mascall, Frank Charles; and Mathers, Cecil George, 3,928,538.
Wace, Peter Frederick; Stockwell, Claude Lewis; and Alder, Peter James, 3,928,207.

United States Gypsum Company: *See—*
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United States of America
Agriculture: *See—*
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Frankel, Edwin N., 3,928,231.
Friedman, Mendel; Ash, John F.; and Fong, Willie, deceased, 3,927,962.
Koenig, Nathan H.; and Friedman, Mendel, 3,927,969.
Air Force: *See—*
Bernstein, Daniel, 3,928,819.
Chenoweth, Amos J.; and Heafner, William E., 3,928,822.
Chodzko, Richard A., 3,928,817.
Hartwick, Thomas S.; and Hodges, Dean T., Jr., 3,928,816.
Army: *See—*
Axelrod, Sydney; and Brenner, Walter, 3,927,616.
Carter, John L.; and McGowan, Joseph, 3,928,806.
Hamilton, Willard C.; and Wegman, Raymond F., 3,928,112.
Moser, James R., deceased; and Moser, Karen, executrix, 3,928,076.
Commerce: *See—*
Wasik, Stanley P., 3,927,978.
Energy Research and Development Administration: *See—*
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Harkness, Samuel D., 3,928,027.
Krikorian, Oscar H., 3,928,549.
Lupica, Sebastian B., 3,928,700.
Rychnovsky, Raymond E., 3,927,850.
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Fohlen, George M.; Parker, John A.; and Sawko, Paul M., 3,928,708.
Health, Education and Welfare: *See—*
Anderson, Norman G.; and Caton, John E., Jr., 3,927,826.
Hudson, Monie S., 3,928,584.
Jacobs, John E., 3,927,977.
Interior: *See—*
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Hoelzen, Warren R.; Hamilton, Charles R.; and Warnock, James E., 3,927,617.
Jensen, Garold K., 3,928,851.
Keithley, Joseph F., 3,927,615.
Kovalenko, Gerald E.; and Woods, Charles E., 3,927,849.
Olson, Irving C., 3,928,853.
Sinsky, Joel A.; and Gregan, Dorsey J. G., 3,927,552.
Spindel, Robert C.; and Porter, Robert P., 3,928,840.
Terry, Michael R., 3,927,632.
Warner, Henry L.; and Haney, Ted I., 3,928,839.
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U.S. Philips Corporation: *See—*
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Buisman, Anthonius Theodorus Maria, 3,927,874.
de Hedouville, Philippe, 3,927,542.
Digoy, Jean Louis, 3,928,866.
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van Boxtel, Antonius Marinus; and Gerritsma, Cornelis Jan, 3,928,658.
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van Esdonk, Johannes; Hornman, Johannes Petrus; and de Hass, Franciscus Cupertinus Maria, 3,928,782.
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United States Steel Corporation: *See—*
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United Technologies Corporation: *See—*
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Hecht, Ralph J.; Goward, George W.; and Elam, Richard C., 3,928,026.

Universal Oil Products Company: *See—*
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Hayes, John C., 3,928,177.
Hilfman, Lee, 3,928,180.
Reichenbacher, Paul H., 3,928,388.
Sobel, Jay E., 3,928,486.
Winter, George R., III; and Boney, William G., 3,927,987.

University of North Carolina: *See—*
Georgiade, Nicholas G.; and Latham, Ralph A. (said Ralph A. Latham assors. to), 3,927,664.

Unsworth, William; and Helsby, Graham Harry, to Magnesium Elektron Limited. Encapsulation of fluids and solids. 3,928,230, Cl. 252-316.000.

Unterstenhofer, Gunter: *See—*
Hammann, Ingeborg; Hoffmann, Peter; Marquarding, Dieter; Ugi, Ivar; and Unterstenhofer, Gunter, 3,928,408.

Uotani, Tsuyoshi: *See—*
Suematsu, Yasuo; Miyazaki, Ryuhei; Kubo, Mitsuyasu; Uotani, Tsuyoshi; and Uchida, Hironori, 3,928,157.

Uozumi, Takahiro: *See—*
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Upjohn Company, The: *See—*
Friis, Walter, Jr.; and Rudzik, Allan D., 3,928,589.
Nelson, Norman A., 3,928,417.
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Pike, John E.; and Schneider, William P., 3,928,425.
Robert, Andre, 3,928,588.
Skaletzky, Louis L., 3,928,596.

Uraneck, Carl A.; and Burleigh, John E., to Phillips Petroleum Company. Preformed polymer latex in emulsion polymerization systems. 3,928,498, Cl. 260-880.00R.

Urankar, Laxmikant: *See—*
Miericke, Jurgen; and Urankar, Laxmikant, 3,927,735.

Urban, Ralph L.: *See—*
Hedge, John A.; Suld, George; and Urban, Ralph L., 3,928,482.

Urbanietz, Josef: *See—*
Duwel, Dieter; Kirsch, Reinhard; Loewe, Heinz; and Urbanietz, Josef, 3,928,375.

Uruma, Fumio: *See—*
Ishikawa, Toshikatsu; Endo, Tei; Masuyama, Toshio; Uruma, Fumio; Morishita, Masutaka; and Kuki, Takeshi, 3,927,986.

Usuda, Matsuo: *See—*
Gondo, Hisashi; Takechi, Hiroshi; Namba, Kazuo; Usuda, Matsuo; and Kawasaki, Kouichi, 3,928,083.

Utahara, Ryozo: *See—*
Umezawa, Hamao; Mitsuhashi, Susumu; Utahara, Ryozo; and Ishikawa, Tetsuo, 3,928,569.

Uyemura & Co., Ltd.: *See—*
Suematsu, Yasuo; Miyazaki, Ryuhei; Kubo, Mitsuyasu; Uotani, Tsuyoshi; and Uchida, Hironori, 3,928,157.

Valbonesi, Giuseppe; and Camiciottoli, Roberto, to Societa Italiana Telecomunicazion Siemens S.p.A. PAM/PCM interface network for TDM telecommunication system. 3,928,725, Cl. 179-15.0AA.

Valis, Jaroslav, to Allmanna Svenska Elektriska Aktiebolaget. Means for frequency/digital conversion. 3,928,798, Cl. 324-78.00D.

van Boxtel, Antonius Marinus; and Gerritsma, Cornelis Jan, to U.S. Philips Corporation. Method of providing transparent conductive electrodes on a transparent insulating support. 3,928,658, Cl. 427-108.000.

Van de Moortele, Guido Ivo, to Unitas S.A. Device for measuring liquids or gasses. 3,927,601, Cl. 91-329.000.

Vandenberg, Edwin J., to Hercules Incorporated. Graft polymers of halo oxirane or oxetane onto halo polymeric backbone. 3,928,501, Cl. 260-890.000.

Vandenberghe, Antoon Leon: *See—*
Poot, Albert Lucien; Heugebaert, Frans Clement; Janssens, Wilhelmus; and Vandenberghe, Antoon Leon, 3,928,686.

van der Kolk, Hans-Jurgen; Mindner, Reinhard; Kiess, Tilman; Muhlich, Peter; Aldinger, Ulrich; and Adler, Karl-Heinz, to Robert Bosch G.m.b.H. Control system for internal combustion engine and variable transmission power train. 3,927,528, Cl. 60-431.000.

van der Lely, Piet, to U.S. Philips Corporation. Record player. 3,927,888, Cl. 274-39.00A.

Van Durme, Etienne: *See—*
Descamps, Marcel; and Van Durme, Etienne, 3,928,384.

Van Eek, Theodoor; and Beukers, Robert, to Gist-Brocades N.V. Compositions of matter. 3,928,573, Cl. 424-122.000.

van Esdonk, Johannes; Hornman, Johannes Petrus; and de Hass, Franciscus Cupertinus Maria, to U.S. Philips Corporation. Method of manufacturing an electric discharge tube and discharge tube obtained in this manner. 3,928,782, Cl. 313-249.000.

van Heerden, Pieter J.: *See—*
Goldberg, Paul; and van Heerden, Pieter J., 3,927,930.

Vanlerberghe, Guy; and Sebag, Henri, to Societe Anonyme dite: L'Oreal. Shampoo composition obtained from the polycondensation of glycidol on alpha diols with fatty chain with alkaline catalysts. 3,928,224, Cl. 252-172.000.

Vannini, Paolo; Anselmino, Luigi; and Frazzini, Giuseppe, to Fiat Societa per Azioni. Angular velocity detecrot arrangement for a vehicle wheel, particularly for an anti-skid brake system. 3,928,780, Cl. 310-168.000.

van Tongerloo, Eric Henry; Ibrahim, Abd-El-Fattah Ali; Colton, Douglas Roy; and Lawrence, John, to Northern Electric Company Limited. Method for making a bi-directional solid state device. 3,928,093, Cl. 148-186.000.

Varga, Gideon M., Jr.: *See—*
King, William H., Jr.; and Varga, Gideon M., Jr., 3,928,063.

Varga, John: *See—*
Spinosa, Dominic; and Varga, John, 3,927,955.

Varner, David E. Selective bird feeder. 3,927,645, Cl. 119-51.00R.

Varo Semiconductor, Inc.: *See—*
Waltz, Douglas G., 3,928,793.

Varta Batterie Aktiengesellschaft: *See—*
Jung, Gerd; and Bauer, Jakob, 3,928,074.
Kothe, Hans-Kurt; and Schneider, Rudi, 3,928,078.

Vener, Frank B.: *See—*
Spier, I. Martin; and Vener, Frank B., 3,927,895.

Verbanc, John Joseph: *See—*
Tarney, Robert Edward; and Verbanc, John Joseph, 3,928,664.

Vergano, Peter J.; and Smith, William E., deceased (by Smith, Frederick L., administrator), to Owens-Illinois, Inc. Boron doping of semiconductors. 3,928,096, Cl. 148-189.000.

Verheyden, Julien P. H.: *See—*
Jenkins, Ian; Moffatt, John G.; and Verheyden, Julien P. H., 3,928,319.

Veriprint Systems Corporation: *See—*
Green, Harold; and Halasz, Stephen J., 3,928,842.

Viannay, Stephane; and Sausse, Andre, to Rhone Poulenc. Membrane-type blood oxygenator with recycle of oxygen-containing gas. 3,927,981, Cl. 23-258.500.

Viennatone Gesellschaft m.b.H.: *See—*
Hueber, Fritz, 3,928,733.

Viertl, John R. M., to General Electric Company. Acoustic imaging apparatus with liquid-filled acoustic corrector lens. 3,927,557, Cl. 73-67.50R.

Vittoz, Eric Andre: *See—*
Oguey, Henri J.; and Vittoz, Eric Andre, 3,928,773.

Vock, Manfred: *See—*
Schreiber, William Lewis; Vock, Manfred; Shuster, Edward Joseph; and Pittet, Alan O., 3,928,644.

Vock, Manfred Hugo: *See—*
Mookherjee, Braja Dulal; Vock, Manfred Hugo; Benaim, Carlos; and Shuster, Edward J., 3,928,248.
Mookherjee, Braja Dulal; Trenkle, Robert Walter; Vock, Manfred Hugo; and Shuster, Edward J., 3,928,645.

Vockenhuber, Karl: *See—*
Muszumanski, Trude, 3,927,931.

Voermans, Ernst Theodoor. Method and apparatus for producing articles of reinforced plastics or like construction. 3,928,674, Cl. 427-171.000.

Vogel, Charles B., to Shell Oil Company. Well logging system using single conductor cable. 3,928,841, Cl. 340-18.0NC.

Voigt, Werner, to Messerschmitt-Bolkow-Blohm GmbH. Freight lashing apparatus, especially for aircraft. 3,927,622, Cl. 105-463.000.

Volante, Donald J.: *See—*
Bolsenga, Stanley J.; Kotow, Stephen S.; Reuter, Henry G.; and Volante, Donald J., 3,927,878.

Vollmar, Kurt, to Pfaff Industriemaschinen GmbH. Sewing machine presser foot and feed dog lifting mechanism. 3,927,629, Cl. 112-212.000.

Volpe, Richard Louis, to Rockwell International Corporation. Weft carrier control apparatus. 3,927,699, Cl. 139-122.00N.

Volz, Hans-Georg: *See—*
De Haes, Louis Maria; and Volz, Hans-Georg, 3,928,037.

Vomel, Wolfgang: *See—*
Berger, Herbert; Gall, Rudi; Thiel, Max; Vomel, Wolfgang; and Sauer, Winfriede, 3,928,342.
Berger, Herbert; Gall, Rudi; Stach, Kurt; Vomel, Wolfgang; and Hoffmann, Rita, 3,928,349.

von Rintelen, Harald: *See—*
Rosenkranz, Hans Jurgen; Rudolph, Hans; Wolff, Erich; and von Rintelen, Harald, 3,928,299.

von Rosenberg, Hermann E.: *See—*
Knudsen, Christian W.; and von Rosenberg, Hermann E., 3,927,996.

Vorkauf, Heinrich: *See—*
Stogmuller, Heinz, 3,927,714.

Vosburgh, Robert D.: *See—*
Hipsher, Gary L.; and Vosburgh, Robert D., 3,928,103.

Vyzkumny ustav obrabecich stroju a obrabeni: *See—*
Kepka, Jiri; Kovarik, Karel; Loun, Bohuslav; and Zeleny, Jaromir, 3,928,827.

W. R. Grace & Co.: *See—*
Billings, Charles Alden; O'Neill, Gerald Joseph; and Simons, Charles William, 3,928,468.
Settineri, Robert A.; and O'Brien, John T., 3,928,690.
Wood, Louis L.; Hartdegen, Frank J.; and Hahn, Peter A., 3,928,138.

Waagner-Biro Aktiengesellschaft: *See—*
Eder, Theodor, 3,928,182.

WABCO Westinghouse GmbH: *See—*
Reinecke, Erich, 3,928,802.

Wace, Peter Frederick; Stockwell, Claude Lewis; and Alder, Peter James, to United Kingdom Atomic Energy Authority. Apparatus for separating particulate solids from liquids. 3,928,207, Cl. 210-252.000.

Wachter, William J.; and Akey, John G. Grid structure for nuclear reactor fuel assembly. 3,928,131, Cl. 176-78.000.

Wada, Shozo; Yoda, Makoto; and Uchiyama, Takashi, to Toa Nenryo Kogyo Kabushiki Kaisha. Process for the production of modified polypropylenes. 3,928,687, Cl. 428-461.000.

Wada, Takanao: *See—*
Yoshinaga, Toshiaki; Wada, Takanao; and Matsuo, Kenji, 3,927,497.

Wagner, Ulrich; and Scherr, Eugen, to Wagner, Wilhelm. Container. 3,927,820, Cl. 229-3.5MF.

Wagner, Wilhelm: *See—*
Wagner, Ulrich; and Scherr, Eugen, 3,927,820.

Wahl, Albert J., to Commercial Decal, Inc. Automatic decal apparatus. 3,928,116, Cl. 156-447.000.

Wakabayashi, Tomisaku: *See—*
Iwasa, Masakazu; Miyatuka, Hajime; Horikawa, Kazuo; and Wakabayashi, Tomisaku, 3,928,655.

Wakita, Eiichi: *See—*
Tanaka, Kazue; Yamamoto, Katsuo; Nakamura, Hisao; and Wakita, Eiichi, 3,927,540.

Walker, Eddie Bob, to Dow Chemical Company, The. Epoxy novolac resins having a narrow molecular weight distribution and process therefor. 3,928,288, Cl. 260-59.0EP.

Walker, Fred W. Power take-off for power steering pump. 3,927,954, Cl. 417-360.000.

Wallace A. Erickson & Company: *See—*
Erickson, Wallace A.; and Suh, Byoung, 3,928,280.

Wallace, Henry L. Ventilating spacer for beehive. 3,927,431, Cl. 6-1.000.

Wallace, Richard W.: *See—*
McIntyre, William H.; Wallace, Richard W.; and Troha, Matthew J., 3,928,161.

Wallsten, Hans Ivar, to AB Inventing. Method of manufacturing means for storing and transporting liquids, gases or fluidized solid particles under pressure. 3,927 464, Cl. 29-454.000.

Walser, Armin: *See—*
Surmatis, Joseph Donald; and Walser, Armin, 3,928,454.
Surmatis, Joseph Donald; and Walser, Armin, 3,928,455.

Walsh, Lloyd R.: *See—*
Anthony, Michael P.; Gunsagar, Kamleshwar; Kim, Choong-Ki; and Walsh, Lloyd R., 3,927,468.

Walter E. Heller Factors, Inc.: *See—*
Mand, Emery M.; and Shapiro, Henry C., 3,928,627.

Walter Kidde & Co., Inc.: *See—*
Erickson, Lars, 3,927,905.
Greenwald, Harry; and Iglio, Salvatore, 3,927,750.

Walther, Gerhard; Merz, Herbert; Langbein, Adolf; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. N-(furyl-or thienyl-methyl)-Desoxy-normorphines and -norcodeines and salt thereof. 3,928,359, Cl. 260-285.000.

Waltz, Douglas G., to Varo Semiconductor, Inc. Power supply circuit with electro-magnetic feedback. 3,928,793, Cl. 321-2.000.

Wandel, Martin; Salamon, Manfred; Dornheim, Gotz Gotmar; and Kuhlmann, Bernard, to Bayer Aktiengesellschaft. Stitched webs of fleeces of synthetic fibers and method of making same. 3,928,696, Cl. 428-102.000.

Wang, Chun Shan; and Mintz, Michael J., to Dow Chemical Company, The. Process for making dialkyl pyridylphosphates. 3,928,370, Cl. 260-297.00P.

Wangdahl, Erik Torsten: *See—*
Bergdahl, Sven-Gunnar; and Wangdahl, Erik Torsten, 3,927,569.

Ward, Peter; and Brocklehurst, Jack. Moulding of synthetic plastics sheet material. 3,928,523, Cl. 264-93.000.

Waren, Frank Arthur Oakley. Apparatus for the collection of buoyant foreign matter. 3,928,206, Cl. 210-242.000.

Warner, Henry L.; and Haney, Ted I., to United States of America, Navy. Sonar system. 3,928,839, Cl. 340-3.00R.

Warner-Lambert Company: *See—*
McShane, James Edward, 3,928,579.

Warnock, James E.: *See—*
Hoelzen, Warren R.; Hamilton, Charles R.; and Warnock, James E., 3,927,617.

Wasik, Stanley P., to United States of America, Commerce. Electrolytic stripping cell and method. 3,927,978, Cl. 23-230.00R.

Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments for cosmetic or dentrifrice use and methods for their production. 3,928,541, Cl. 423-339.000.

Watanabe, Tetsuo: *See—*
Mase, Shunzo; and Watanabe, Tetsuo, 3,927,815.

Watanabe, Tetsuya: *See—*
Saitoh, Shigeru; Watanabe, Tetsuya; Konno, Koji; Yaguchi, Kunihide; Kodama, Kenji; and Miyamori, Tamotsu, 3,928,537.

Watatani, Yoshizumi; Mohri, Katsuo; Fukuda, Masaaki; Kayano, Tatsuo; and Yoshino, Takehiko, to Hitachi, Ltd.; Hitachi Electronics Co., Ltd.; and Hoso Kyokai. Synchronizing signal regenerator. 3,928,720, Cl. 178-69.50G.

Water Purification Associates: *See—*
Calmon, Calvin, 3,928,200.

Waters, William D., to Youngstown Sheet and Tube Company. Modified vinyl ester resin and pipe made therefrom. 3,928,491, Cl. 260-837.000.

Wax, Jerome R. Lumbo-sacral support. 3,927,665, Cl. 128-78.000.

Weber, Alwin. Piercing spout. 3,927,803, Cl. 222-91.000.

Weber, Helmut: *See—*
Weyer, Rudy; Aumuller, Walter; Weber, Helmut; Schweitzer, Roland; and Heerdt, Ruth, 3,928,610.

Weekley, Alfred E.: *See—*
Johnson, Aaron C., 3,927,745.

Wegman, Raymond F.: *See—*
Hamilton, Willard C.; and Wegman, Raymond F., 3,928,112.

Weijland, Willem Paul, to U.S. Philips Corporation. Television camera tube with control diaphragm. 3,928,784, Cl. 313-389.000.

Weir, Donald Robert, to Sherritt Gordon Mines Limited. Treatment of nickel-bearing ammonium carbonate leach liquors. 3,928,020, Cl. 75-.50A.

Weisner, Carl S.: *See—*
Chill, Leonard; Johnson, Gordon B.; and Weisner, Carl S., 3,927,957.

Weiss, Stephen F. Homodyne FM receiver with folded signal and gated unfolding signal detection. 3,928,807, Cl. 325-344.000.

Welstead, William John, Jr., to A. H. Robins Company, Incorporated. 1-Cyclopropyl-1-phenyl-omega-amino-1-lower alkanoyloxyalkanes. 3,928,426, Cl. 260-490.000.

Welstead, William John, Jr., to A. H. Robins Company, Incorporated. 1-Cyclopropyl-1-phenyl-ω-amino-1-alkanols and 1-lower-alkylacyl derivatives for treating depression. 3,928,625, Cl. 424-330.000.

Weman, Per Olaf, to Sigmatex. Motor vehicle equipped with inflatable air bags for passenger accident protection. 3,927,901, Cl. 280-150.0AB.

Wendel, Martin Maurice: *See—*
Gregory, Donald Dale; and Wendel, Martin Maurice, 3,928,543.

Wenrich, Tom C., to American Standard, Inc. Four-way poppet valve device. 3,927,692, Cl. 137-625.270.

Wentworth, William A., to Napko Corporation. Solid hardener compositions. 3,928,346, Cl. 260-249.600.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See—*
Engel, Walter, 3,927,618.

Werle, Eugen; Fritz, Hans; and Schult, Harald, to Farbenfabriken Bayer Aktiengesellschaft. Urea derivatives of acyl derivatives of KTI. 3,928,305, Cl. 260-112.500.

Werner, Robert H.: *See—*
Carter, Richard S.; Hogan, Spurgeon G., Jr.; Leung, Wan L.; McGilvray, Bruce L.; and Werner, Robert H., 3,928,857.

West Company, The: *See—*
Martin, Frederick W., 3,927,476.

Westinghouse Air Brake Company: *See—*
Hyler, John H.; and Johnson, Clifford E., 3,927,759.

Westinghouse Electric Corporation: *See—*
Adams, Maurice L., Jr.; and Raimondi, Albert A., 3,927,889.
Adams, Maurice L., Jr., 3,927,890.
Byrne, Francis P.; and Kaczmarek, Thomas D., 3,927,979.
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B 260,455	3,925,634	Dec. 9, 1975
B 260,945	3,925,250	Dec. 9, 1975
B 261,378	3,913,468	Oct. 21, 1975
B 261,828	3,925,551	Dec. 9, 1975
B 262,241	3,925,528	Dec. 9, 1975
B 262,287	3,921,209	Nov. 18, 1975
B 262,378	3,914,410	Oct. 21, 1975
B 264,257	3,928,665	Dec. 23, 1975
B 264,833	3,923,566	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975
B 265,862	3,915,915	Oct. 28, 1975
B 266,195	3,923,599	Dec. 2, 1975
B 269,673	3,914,377	Oct. 21, 1975
B 270,089	3,923,875	Dec. 2, 1975
B 271,104	3,925,400	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975
B 276,560	3,916,030	Oct. 28, 1975
B 277,449	3,924,048	Dec. 2, 1975
B 278,491	3,921,170	Nov. 18, 1975
B 278,991	3,914,469	Oct. 21, 1975
B 279,583	3,923,749	Dec. 2, 1975
B 280,015	3,925,378	Dec. 9, 1975
B 280,395	3,919,604	Nov. 11, 1975
B 281,341	3,920,643	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975
B 282,081	3,913,483	Oct. 21, 1975
B 282,252	3,924,997	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975
B 283,300	3,925,011	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975
B 285,200	3,923,680	Dec. 2, 1975
B 285,796	3,914,303	Oct. 21, 1975
B 286,499	3,914,129	Oct. 21, 1975
B 286,614	3,924,696	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975
B 287,164	3,914,139	Oct. 21, 1975
B 287,270	3,924,825	Dec. 9, 1975
B 287,275	3,925,141	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975
B 288,018	3,925,239	Dec. 9, 1975
B 288,627	3,916,179	Oct. 28, 1975
B 288,638	3,925,132	Dec. 9, 1975
B 289,175	3,924,309	Dec. 9, 1975
B 289,471	3,917,184	Nov. 4, 1975
B 289,523	3,921,166	Nov. 18, 1975
B 289,883	3,925,063	Dec. 9, 1975
B 290,328	3,924,838	Dec. 9, 1975
B 291,104	3,925,007	Dec. 9, 1975
B 291,694	3,925,339	Dec. 9, 1975
B 292,054	3,915,877	Oct. 28, 1975
B 292,126	3,914,465	Oct. 21, 1975
B 292,140	3,914,340	Oct. 21, 1975
B 292,300	3,927,167	Dec. 16, 1975
B 292,563	3,923,653	Dec. 2, 1975
B 293,378	3,923,725	Dec. 2, 1975
B 293,437	3,913,414	Oct. 21, 1975
B 294,103	3,924,396	Dec. 9, 1975
B 294,579	3,916,737	Nov. 4, 1975
B 294,673	3,916,023	Oct. 28, 1975
B 295,481	3,921,593	Nov. 25, 1975
B 295,674	3,916,107	Oct. 28, 1975
B 295,860	3,923,880	Dec. 2, 1975
B 299,267	3,917,106	Nov. 4, 1975
B 300,353	3,921,734	Nov. 25, 1975
B 302,692	3,924,598	Dec. 9, 1975
B 302,836	3,923,573	Dec. 2, 1975
B 302,998	3,928,233	Dec. 23, 1975
B 303,655	3,924,642	Dec. 9, 1975
B 303,702	3,914,131	Oct. 21, 1975
B 304,687	3,924,783	Dec. 9, 1975
B 305,417	3,915,882	Oct. 28, 1975
B 305,868	3,921,463	Nov. 25, 1975
B 305,881	3,923,478	Dec. 2, 1975
B 306,829	3,925,411	Dec. 9, 1975
B 306,938	3,916,050	Oct. 28, 1975
B 307,677	3,915,276	Oct. 28, 1975
B 308,661	3,924,349	Dec. 9, 1975
B 308,892	3,919,624	Nov. 11, 1975
B 309,207	3,914,743	Oct. 21, 1975
B 309,499	3,922,002	Nov. 25, 1975
B 309,681	3,927,374	Dec. 16, 1975
B 309,755	3,919,468	Nov. 11, 1975
B 309,756	3,914,136	Oct. 21, 1975
B 309,860	3,922,485	Nov. 25, 1975
B 310,149	3,924,705	Dec. 9, 1975
B 310,271	3,923,689	Dec. 2, 1975
B 311,313	3,925,142	Dec. 9, 1975
B 311,317	3,918,975	Nov. 11, 1975
B 311,413	3,925,515	Dec. 9, 1975
B 311,910	3,924,357	Dec. 9, 1975
B 311,911	3,925,233	Dec. 9, 1975
B 312,139	3,925,530	Dec. 9, 1975
B 312,477	3,923,714	Dec. 2, 1975
B 313,098	3,925,045	Dec. 9, 1975
B 313,531	3,925,548	Dec. 9, 1975
B 313,594	3,924,626	Dec. 9, 1975
B 313,900	3,915,932	Oct. 28, 1975
B 314,049	3,920,588	Nov. 18, 1975
B 314,255	3,923,764	Dec. 2, 1975
B 314,271	3,921,845	Nov. 25, 1975
B 314,489	3,925,016	Dec. 9, 1975
B 314,977	3,923,459	Dec. 2, 1975
B 315,363	3,920,673	Nov. 18, 1975
B 315,397	3,923,963	Dec. 2, 1975
B 315,731	3,914,108	Oct. 21, 1975
B 316,014	3,920,861	Nov. 18, 1975
B 316,239	3,913,546	Oct. 21, 1975
B 316,917	3,925,494	Dec. 9, 1975
B 317,080	3,925,324	Dec. 9, 1975
B 317,347	3,923,552	Dec. 2, 1975
B 317,624	3,925,167	Dec. 9, 1975
B 318,195	3,915,699	Oct. 28, 1975
B 318,618	3,915,365	Oct. 28, 1975
B 318,640	3,925,186	Dec. 9, 1975
B 318,745	3,916,571	Nov. 4, 1975
B 319,226	3,925,082	Dec. 9, 1975
B 319,339	3,916,056	Oct. 28, 1975
B 319,402	3,919,568	Nov. 11, 1975
B 319,414	3,928,666	Dec. 23, 1975
B 320,261	3,924,033	Dec. 2, 1975
B 320,452	3,925,083	Dec. 9, 1975
B 320,603	3,915,571	Oct. 28, 1975
B 321,018	3,921,623	Nov. 25, 1975
B 321,101	3,917,163	Nov. 4, 1975
B 321,938	3,923,889	Dec. 2, 1975
B 322,182	3,925,390	Dec. 9, 1975
B 322,239	3,920,973	Nov. 18, 1975
B 322,564	3,914,373	Oct. 21, 1975
B 322,611	3,920,863	Nov. 18, 1975

DOCUMENT NUMBER
B 322,777
B 323,127
B 323,191
B 323,203
B 323,568
B 323,666
B 324,495
B 324,503
B 324,505
B 324,739
B 324,879
B 325,102
B 325,262
B 326,514
B 327,109
B 327,363
B 327,612
B 327,674
B 327,899
B 328,164
B 328,200
B 328,205
B 328,210
B 328,870
B 329,115
B 329,476
B 329,612
B 329,787
B 329,816
B 330,536
B 330,828
B 331,417
B 331,557
B 331,895
B 332,527
B 332,811
B 333,876
B 333,928
B 334,251
B 334,868
B 334,985
B 335,670
B 335,741
B 335,773
B 336,129
B 336,243
B 336,345
B 336,652
B 336,902
B 336,946
B 336,978
B 337,235
B 337,409
B 337,442
B 337,703
B 337,787
B 339,057
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B 342,084
B 342,423
B 342,886
B 343,136
B 343,240
B 343,506
B 343,577
B 344,203
B 344,479
B 345,060
B 345,384
B 345,422
B 345,527
B 345,567
B 346,165
B 346,210
B 346,350
B 346,487
B 346,585
B 346,613
B 346,901
B 348,083
B 348,383
B 348,495
B 348,558

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 322,777	3,924,382	Dec. 9, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,803	3,919,470	Nov. 11, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 343,240	3,925,693	Dec. 9, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,910	3,925,696	Dec. 9, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,734	3,915,764	Oct. 28, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 362,589	3,914,012	Oct. 21, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 363,205	3,923,744	Dec. 2, 1975
B 346,350	3,915,824	Oct. 28, 1975	B 363,337	3,928,639	Dec. 23, 1975
B 346,487	3,927,406	Dec. 16, 1975	B 363,457	3,922,595	Nov. 25, 1975
B 346,585	3,913,820	Oct. 21, 1975	B 363,892	3,913,395	Oct. 21, 1975
B 346,613	3,923,545	Dec. 2, 1975	B 363,962	3,921,826	Nov. 25, 1975
B 346,901	3,915,583	Oct. 28, 1975	B 364,022	3,913,499	Oct. 21, 1975
B 348,083	3,923,774	Dec. 2, 1975	B 364,163	3,916,092	Oct. 28, 1975
B 348,383	3,923,452	Dec. 2, 1975	B 364,241	3,916,668	Nov. 4, 1975
B 348,495	3,914,654	Oct. 21, 1975	B 364,334	3,924,670	Dec. 9, 1975
B 348,558	3,914,109	Oct. 21, 1975	B 364,528	3,919,510	Nov. 11, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 364,786	3,921,673	Nov. 25, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 410,062	3,923,855	Dec. 2, 1975
B 387,039	3,924,510	Dec. 9, 1975	B 410,168	3,914,717	Oct. 21, 1975
B 387,331	3,913,701	Oct. 21, 1975	B 411,145	3,914,168	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975	B 411,356	3,919,649	Nov. 11, 1975
B 387,687	3,918,151	Nov. 11, 1975	B 411,483	3,925,196	Dec. 9, 1975
B 387,761	3,914,245	Oct. 21, 1975	B 411,633	3,914,741	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975	B 412,516	3,927,417	Dec. 16, 1975
B 387,818	3,918,935	Nov. 11, 1975	B 412,619	3,925,292	Dec. 9, 1975
B 388,580	3,923,712	Dec. 2, 1975	B 412,867	3,924,587	Dec. 9, 1975
B 389,070	3,914,171	Oct. 21, 1975	B 413,006	3,914,850	Oct. 28, 1975
B 389,285	3,914,631	Oct. 21, 1975	B 413,546	3,924,314	Dec. 9, 1975
B 389,327	3,924,504	Dec. 9, 1975	B 414,129	3,925,484	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975	B 414,288	3,925,537	Dec. 9, 1975
B 389,726	3,921,010	Nov. 18, 1975	B 415,113	3,915,717	Oct. 28, 1975
B 389,807	3,922,623	Nov. 25, 1975	B 415,124	3,915,944	Oct. 28, 1975

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B 415,845
B 415,847
B 415,957
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B 416,598
B 416,832
B 416,710
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B 418,153
B 418,302
B 419,327
B 419,481
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CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

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B 415,845	3,925,076	Dec. 9, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 415,847	3,914,208	Oct. 21, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 415,957	3,925,635	Dec. 9, 1975	B 430,140	3,922,084	Nov. 25, 1975
B 415,977	3,927,359	Dec. 16, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 416,598	3,923,473	Dec. 2, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 432,373	3,919,670	Nov. 11, 1975
B 416,710	3,923,746	Dec. 2, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 416,933	3,924,968	Dec. 9, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 418,121	3,925,023	Dec. 9, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 418,302	3,913,252	Oct. 21, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 420,016	3,914,572	Oct. 21, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 422,399	3,928,656	Dec. 23, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 422,467	3,924,804	Dec. 9, 1975	B 444,614	3,927,996	Dec. 23, 1975
B 422,949	3,921,873	Nov. 25, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 424,415	3,919,458	Nov. 11, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 424,462	3,920,522	Nov. 18, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 424,572	3,924,979	Dec. 9, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 424,748	3,924,395	Dec. 9, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 425,035	3,914,025	Oct. 21, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 425,345	3,922,015	Nov. 25, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 425,470	3,923,796	Dec. 2, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 425,539	3,916,742	Nov. 4, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 425,541	3,914,051	Oct. 21, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975	B 459,425	3,928,773	Dec. 23, 1975
B 427,631	3,921,433	Nov. 25, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 428,177	3,914,624	Oct. 21, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 428,795	3,921,056	Nov. 18, 1975	B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF DECEMBER, 1975

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baer, James I., to Baka International Marketing Corporation. Fluid motor and material handling apparatus and the like utilizing same. Re. 28,663, Cl. 294-99.00R.

Baka International Marketing Corporation: *See*—
Baer, James I., Re. 28,663.

Barger, J. P.; Crandell, William H.; and Gardner, Thomas W., to Dynatech Corporation. Cryosurgical apparatus. Re. 28,657, Cl. 128-303.100.

Bell Telephone Laboratories, Incorporated: *See*—
Miller, Stewart Edward, Re. 28,664.

Bilz, Otto; and Fauth, Otto, to Otto Bilt, Firma. Quick-change chuck with adjustable tool-holding socket. Re. 28,662, Cl. 279-75.000.

Crandell, William H.: *See*—
Barger, J. P.; Crandell, William H.; and Gardner, Thomas W., Re. 28,657.

De La Instruments Limited: *See*—
Pettet, Ronald Sidney, Re. 28,660.

Dynatech Corporation: *See*—
Barger, J. P.; Crandell, William H.; and Gardner, Thomas W., Re. 28,657.

Fauth, Otto: *See*—
Bilz, Otto; and Fauth, Otto, Re. 28,662.

Gardner, Thomas W.: *See*—
Barger, J. P.; Crandell, William H.; and Gardner, Thomas W., Re. 28,657.

MacDaniel, Gene D., to Sweetheart Plastics, Inc. Insulated plastic bucket. Re. 28,658, Cl. 229-1.50B.

Miller, Stewart Edward, to Bell Telephone Laboratories, Incorporated. Single material optical fiber structures including thin film supporting members. Re. 28,664, Cl. 350-96.0WG.

Otto Bilt, Firma: *See*—
Bilz, Otto; and Fauth, Otto, Re. 28,662.

Pettet, Ronald Sidney, to De La Instruments Limited. Discriminating apparatus for moving translucent sheets. Re. 28,660, Cl. 271-263.000.

Pettibone Corporation: *See*—
Wenninger, Clifford E., deceased, Re. 28,659.

Sweetheart Plastics, Inc.: *See*—
MacDaniel, Gene D., Re. 28,658.

Tredway, Wynn B., Sr. Golf swing training glove including light projecting device. Re. 28,661, Cl. 273-183.00B.

Wenninger, Clifford E., deceased, to Pettibone Corporation. Sandmulling apparatus. Re. 28,659, Cl. 241-110.000.

Zagoroff, Dimiter S. Heat gun. Re. 28,665, Cl. 431-347.000.

LIST OF PLANT PATENTEES

Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 3,818, 12–23–75, Cl. 18.

Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 3,819, 12–23–75, Cl. 19.

Bailey, Dorothy J. S., to San Joaquin Rose Co. Rose plant. 3,820, 12–23–75, Cl. 20.

Harris, Caroline P., to Plumwood Associates. Plum tree. 3,823, 12–23–75, Cl. 38.

J and L Plants Inc.: *See*—
Pittman, Roy N. 3,821.

McGredy, Samuel D. Rose plant. 3,822, 12–23–75, Cl. 12.

Pittman, Roy N., to J and L Plants Inc. Kalanchoe plant. 3,821, 12–23–75, Cl. 68.

Plumwood Associates: *See*—
Harris, Caroline P. 3,823.

San Joaquin Rose Co.: *See*—
Bailey, Dorothy J. S. 3,818.
Bailey, Dorothy J. S. 3,819.
Bailey, Dorothy J. S. 3,820.

LIST OF DESIGN PATENTEES

Aceline Products Corp.: *See*—
Doria, Barbara J. 238,189.

Alexander, Merton J. Sphygmomanometer dial face. 238,209, 12–23–75, Cl. D83—1.

Amoroso, Nicholas A., to Bright Star Industries. Bicycle reflector. 238,155, 12–23–75, Cl. D10—111.

Alexander, Merton J. Arm rest. 238,134, 12–23–75, Cl. D6—194.

Anderson, Karl G., to Duni Bila AB. Bib with catch-pocket. 238,117, 12–23–75, Cl. D2—229.

Argandona, Augusto: *See*—
Long, Douglas G., and Argandona. 238,210.

Banich, John T., to Design Devices, Inc. Ultrasonic rodent eliminator. 238,171, 12–23–75, Cl. D22—18.

Bay, J. Myron. Bottle. 238,143, 12–23–75, Cl. D9—48.

Bengt Erling Beckman: *See*—
Ricksater, Bertil V. 238,180.

Bieringer, Cecelia A. Paper weight. 238,169, 12–23–75, Cl. D19—96.

Binder, Joseph, M. J. Viesti, and C. Palestini, to The Bohack Corp. Store. 238,162, 12–23–75, Cl. D13—1.

Bissell, Inc.: *See*—
Goodrich, Gordon W. 238,139.

Blackstone, George H. Water purifying and filtering unit. 238,172, 12–23–75, Cl. D23—3.

Boldt, Melvin H., to Rowe International, Inc. Phonograph. 238,201, 12–23–75, Cl. D56—4.

Boldt, Melvin H., to Rowe International, Inc. Phonograph. 238,200, 12–23–75, Cl. D56—4.

Bright Star Industries: *See*—
Amoroso, Nicholas A. 238,155.

Bunk Trunk Distributors: *See*—
Mendlin, Michael A. 238,131.

Calvert, Rodney K., to The Mead Corp. Bottle carrier. 238,146, 12–23–75, Cl. D9—178.

Cardiac Scan Service, Inc.: *See*—
Hesen, Joseph A. 238,208.

Carre, Alain, to Waterman S.A. Cigarette lighter. 238,187, 12–23–75, Cl. D27—36.

Carre, Alain, to Waterman S.A. Cigarette lighter. 238,188, 12–23–75, Cl. D27—36.

Casparro, John J., to Don Fedderson Productions, Inc. Carousel advertising sign display for stores. 238,215, 12–23–75, Cl. D95—12.

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Cohen, William J., to CITC Industries. Sport shoe. 238,122, 12–23–75, Cl. D2—310.

Cohen, William J., to CITC Industries. Foxing tape. 238,124, 12–23–75, Cl. D2—328.

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Cudzik, Daniel F., to Reynolds Metals Co. Non-detachable easy-open end closure. 238,150, 12–23–75, Cl. D9—255.

Cudzik, Daniel F., to Reynolds Metals Co. Non-detachable easy-open end closure. 238,150, 12–23–75, Cl. D9—255.

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Dilot, Rolf M. Combined container and cover for foodstuffs or the like. 238,148, 12–23–75, Cl. D9—219.

Don Fedderson Productions, Inc.: *See*—
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Doria, Barbara J., to Aceline Products Corp. Medicated collar for pets. 238,189, 12–23–75, Cl. D30—38.

Duderstadt, John F., J. W. Stiffler, and H. D. Fetty, to The Goodyear Tire & Rubber Co. Tire. 238,159, 12–23–75, Cl. D12—147

Duni Bila AB: *See*—
Anderson, Karl G. 238,117.

Eastman Kodak Co.: *See*—
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Enderling, Wayne W. Kiosk. 238,163, 12–23–75, Cl. D13—1.

Fear, Marcia B., to Marcia Bell Fear. Pendant. 238,198, 12–23–75, Cl. D45—16.

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Felt, Roger B., to Perma-Technological Industries, Inc.

Dental tool. 238,174, 12–23–75, Cl. D24—1.
Fernandez, Mario F., to The Toro Co. Shrouding for lawn mower engine. 238,197, 12–23–75, Cl. D40—1.
Firkser, Barbara L. Two piece bathing suit. 238,116, 12–23–75, Cl. D2—41.
Fox, Douglas J., to The Singer Co. Frame of a sewing machine. 238,207, 12–23–75, Cl. D70—1.
General Electric Co.: *See*—
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Goodrich, Gordon W., to Bissell, Inc. Vacuum cleaner housing. 238,133, 12–23–75, Cl. D7—165.
Guimarin, Henry L. Ratchet wrench. 238,140, 12–23–75, Cl. D8—25.
Harms, Robert G.: *See*—
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Haunenstein, Max C., to General Electric Co. Spout for a water reservoir type coffeemaker or similar article. 238,138, 12–23–75, Cl. D7—129.
Hesen, Joseph A., to Cardiac Scan Service, Inc. Electrocardiographic recording holster. 238,208, 12–23–75, Cl. D83—1.
Ing. C. Olivette & C., S.p.A.: *See*—
Sottsass, Ettore, Jr. 238,204.
Jay, Walter M. Table or other similar article. 238,129, 12–23–75, Cl. D6—175.
Jennings, Carl C. Double-headed bowling pin. 238,192, 12–23–75, Cl. D34—5.
Johnson, Vern H., and R. G. Harms, to Loyd Walters and Donald Kunau. Level tool. 238,153, 12–23–75, Cl. D10—69.
Kahn, Evan R. Hair cutting scissors. 238,141, 12–23–75, Cl. D8—57.
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Ketcham, Henry K., to Rolande Ketcham. Building block unit. 238,144, 12–23–75, Cl. D9—171.
Kingsford, Ted I., to Plough, Inc. Cosmetic applicator. 238,212. 12–23–75, Cl. D86—10.
Kinnan, Frank R., to Midland-Ross Corp. Cable conduit with arched detachable closure plate. 238,178, 12–23–75, Cl. D26—5.
Kinnan, Frank R., to Midland-Ross Corp. Cable conduit with detachable closure plate. 238,179, 12–23–75, Cl. D26—5.
Kizawa, Hisashi. Speaker enclosure, or the like. 238,182, 12–23–75, Cl. D26—14.
Korman, Melvin, and L. M. Sheldon, to General Electric Co. Electrical connector. 238,176, 12–23–75, Cl. D26—1.
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Long, Douglas G., and A. Argandona, to Sunbeam Corp. Hair styler. 238,210, 12–23–75, Cl. D86—10.
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Rivera, Robert J. Tennis racket jacket. 238,214, 12–23–75, Cl. D87—1.
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Roller, William G., to G. & R. Industries, Inc. Panel mounted monitoring switch. 238,181, 12–23–75, Cl. D26—13.
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Boldt, Melvin H. 238,200.
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Rubenstein, Lester E. Combined watch dial and hands therefor. 238,152, 12–23–75, Cl. D10—33.
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Shaffer, Philip E. Accessory tray for a paint can or the like. 238,151, 12–23–75, Cl. D9—289.
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Synder, Jeffrey. Handle cap for brushes and the like. 238,127, 12–23–75, Cl. D4—4.
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522 3,928,748

CLASS 220
3.8 3,927,785
4R 3,927,786
9LG 3,927,787
3,927,788
21 3,927,789
72 3,927,790
89B 3,927,791
210 3,927,792
266 3,927,793
268 3,927,794
269 3,927,795
281 3,927,796
318 3,927,797
374 3,927,798

CLASS 221
223 3,927,799

CLASS 222
26 3,927,800
61 3,927,801
67 3,927,802
91 3,927,803
136 3,927,804
153 3,927,805
402.12 3,927,806
430 3,927,807

CLASS 224
1A 3,927,808
5R 3,927,809
29R 3,927,810
42.03B 3,927,811
48R 3,927,812

CLASS 226
135 3,927,813
199 3,927,814

CLASS 228
4.5 3,928,749
121 3,927,815
147 3,927,816
157 3,927,817
189 3,927,818
212 3,927,819

CLASS 229
1.5B Re.28,658
3.5MF 3,927,820
14BL 3,927,821
23R 3,927,822
31R 3,927,823
37R 3,927,824
55 3,927,825

CLASS 233
11 3,927,826

CLASS 235
61.11A 3,928,750
61.11E 3,928,827
92PD 3,928,752
92PK 3,928,751
3,928,753
150.2 3,928,754
152 3,928,755
153AK 3,928,830
183 3,928,756

CLASS 236
49 3,927,827
3,927,828
92B 3,927,829
100 3,927,830

CLASS 237
9R 3,927,831

CLASS 239
168 3,927,832
306 3,927,833
359 3,927,834
400 3,927,835

CLASS 240
51.11R 3,928,757
73R 3,928,758

CLASS 241
19 3,927,836
46.11 3,927,837
46.15 3,927,838
76 3,927,839
110 Re.28,659
187 3,927,840

CLASS 242
1.1R 3,927,842
7.05B 3,927,843
55 3,927,844
68.3 3,927,845
107.4 3,927,846
192 3,927,847
198 3,927,848

CLASS 244
3.22 3,927,849
145 3,927,850

CLASS 246
37 3,927,851
126 3,927,852

CLASS 248
188.2 3,927,853
372 3,927,854

CLASS 249
79 3,927,855
177 3,927,856
217 3,927,857
219R 3,927,858

CLASS 250
199 3,928,760
205 3,928,761
270 3,928,762
3,928,763
272 3,928,764
3,928,765
273 3,928,766
320 3,928,767
333 3,928,768
445T 3,928,769
481 3,928,770
568 3,928,759

CLASS 251
147 3,927,859
299 3,927,860

CLASS 252
8.1 3,928,210
8.5B 3,928,211
8.6 3,928,212
8.8 3,928,213
11 3,928,214
33.3 3,928,215
33.4 3,928,216
45 3,928,217
49.6 3,928,218
51.5R 3,928,219
62.62 3,928,220
70 3,928,221
88 3,928,222
95 3,928,223
172 3,928,224
182 3,928,225
301.2C 3,928,227
301.2R 3,928,226
301.2W 3,928,228
301.6P 3,928,229
316 3,928,230
413 3,928,231
428 3,928,232
455R 3,928,234
455Z 3,928,233
458 3,928,235
463 3,928,236
465 3,928,237
3,928,238
466PT 3,928,239
467 3,928,240
470 3,928,241
513 3,928,242
514 3,928,243
520 3,928,244
521 3,928,245
522 3,928,246
3,928,247
3,928,248
526 3,928,249
542 3,928,250
545 3,928,251

CLASS 254
29R 3,927,861
76 3,927,862
103 3,927,863
3,927,864
105 3,927,865
134.4 3,927,866
175.7 3,927,867

CLASS 259
4 3,927,868
192 3,927,869

CLASS 260
2.3 3,928,253
2.5AS 3,928,257
3,928,258
2.5BF 3,928,256
2.5B 3,928,254
2.5R 3,928,255
5 3,928,259
14 3,928,260
17R 3,928,261
3,928,262
3,928,263
17.2 3,928,264
21 3,928,265
22CB 3,928,266
23AR 3,928,269
23XA 3,928,267
23H 3,928,268
23.7M 3,928,270
29.2TN 3,928,271
29.4UA 3,928,273
29.4R 3,928,272
31.8B 3,928,275
34.2 3,928,276
37N 3,928,277
40R 3,928,278
3,928,279
42.28 3,928,280
42.39 3,928,281
42.44 3,928,282
45.7P 3,928,283
45.75K 3,928,285
45.75S 3,928,284
47CB 3,928,287
47UA 3,928,286
59EP 3,928,288
75NQ 3,928,289
75TN 3,928,290
75R 3,928,291
77.5AQ 3,928,292
79 3,928,293
79.3A 3,928,294
79.3M 3,928,295
85.3R 3,928,297
88.7B 3,928,298
89.5N 3,928,299
93.5A 3,928,300
94.2R 3,928,301
94.3 3,928,302
3,928,303
94.9D 3,928,304
112.5LH 3,928,307
3,928,308
112.5R 3,928,306
112.5 3,928,305
146R 3,928,309
152 3,928,310
156 3,928,311
3,928,312
173 3,928,313
203 3,928,314
204 3,928,315
209R 3,928,316
210AB 3,928,317
210R 3,928,318
211.5R 3,928,319
211.7 3,928,320
233.5 3,928,321
236.5 3,928,322
239B 3,928,323
239.1 3,928,324
3,928,325
239.55D 3,928,326
240G 3,928,328
240J 3,928,327
240.1 3,928,329
242 3,928,330
243A 3,928,332
243C 3,928,331
3,928,333
3,928,334
3,928,335
3,928,336
3,928,337
3,928,338
244R 3,928,339
247.1L 3,928,340
247.5EP 3,928,342
247.5G 3,928,341
248NS 3,928,343
249.5 3,928,344
3,928,345
249.6 3,928,346
250AC 3,928,349
250BN 3,928,351
250A 3,928,348
250B 3,928,347
3,928,352
250Q 3,928,350
256.4E 3,928,353
256.4Q 3,928,354
268BC 3,928,358
268PL 3,928,355
268TR 3,928,356
3,928,357
285 3,928,359
293.54 3,928,360
294.8B 3,928,362
294.8F 3,928,361
294.9 3,928,274
295R 3,928,364
295.5R 3,928,363
3,928,365
3,928,366
296B 3,928,367
296H 3,928,368
296R 3,928,369
297P 3,928,370
297T 3,928,371
302H 3,928,372
307D 3,928,373
309 3,928,374
309.2 3,928,375
309.5 3,928,376
3,928,377
310R 3,928,378
326.5L 3,928,379
326.9 3,928,380
327B 3,928,383
327C 3,928,381
327M 3,928,382
330.5 3,928,384
332.1 3,928,385
338 3,928,386
343 3,928,387
343.2 3,928,388
346.1R 3,928,389
346.2R 3,928,390
3,928,391
346.8A 3,928,392
348.5L 3,928,393
369 3,928,394
3,928,395
380 3,928,396
397.2 3,928,397
397.5 3,928,398
410.5 3,928,399
410.7 3,928,401
410.9N 3,928,403
410.9R 3,928,402
410.9V 3,928,400
413 3,928,404
435A 3,928,405
448.8R 3,928,406
453R 3,928,407
465D 3,928,412
465F 3,928,408
465.3 3,928,409
465.5R 3,928,410
468G 3,928,411
469 3,928,413

	3,928,414
470	3,928,415
471R	3,928,416
473A	3,928,417
	3,928,418
473S	3,928,419
475P	3,928,420
479R	3,928,421
481R	3,928,422
482P	3,928,423
485G	3,928,424
488R	3,928,425
490	3,928,426
501.17	3,928,427
513T	3,928,428
515P	3,928,430
515R	3,928,429
519	3,928,431
521H	3,928,432
524R	3,928,433
541	3,928,434
542	3,928,435
551R	3,928,436
552R	3,928,437
553B	3,928,438
557R	3,928,439
561K	3,928,444
561N	3,928,440
	3,928,441
	3,928,442
	3,928,443
566AE	3,928,446
566A	3,928,445
567.6M	3,928,447
567.6P	3,928,448
570.7	3,928,449
571	3,928,450
580	3,928,451
586R	3,928,452
	3,928,453
	3,928,454
	3,928,455
	3,928,456
593R	3,928,457
	3,928,458
601R	3,928,459
603HF	3,928,461
603C	3,928,460
604R	3,928,462
606.5P	3,928,463
610R	3,928,464
	3,928,465
	3,928,466
	3,928,467
611R	3,928,468
621C	3,928,469
	3,928,477
622R	3,928,470
627G	3,928,471
628	3,928,472
635H	3,928,473
	3,928,474
645	3,928,475
646	3,928,476
651R	3,928,478
658R	3,928,479
666M	3,928,480
668D	3,928,481
	3,928,484
668F	3,928,482
668R	3,928,483
680R	3,928,485
683.49	3,928,486
683.51	3,928,487
683.68	3,928,488
827	3,928,489
	3,928,490
837	3,928,491
850	3,928,492
864	3,928,493
876R	3,928,494
	3,928,495
	3,928,496
878R	3,928,497
880R	3,928,498
884	3,928,500
885	3,928,499
890	3,928,501
891	3,928,502
897B	3,928,504
897C	3,928,503
921	3,928,505
924	3,928,506
940	3,928,507
943	3,928,508
945	3,928,509
962	3,928,510

CLASS 261

64C	3,928,511
91	3,928,512
113	3,928,513

CLASS 264

3B	3,928,514
5	3,928,515
29	3,928,516
38	3,928,517
40	3,928,518
	3,928,519
42	3,928,520
49	3,928,521
89	3,928,522
93	3,928,523
117	3,928,524
174	3,928,525
236	3,928,526
258	3,928,527
344	3,928,528

CLASS 266

4E	3,927,870

CLASS 267

65R	3,927,871

CLASS 269

32	3,927,872
154	3,927,873

CLASS 270

61F	3,927,874
83	3,927,875

CLASS 271

10	3,927,876
11	3,927,877
173	3,927,878
263	Re.28,660

CLASS 272

76	3,927,879

CLASS 273

1E	3,927,880
58K	3,927,881
65E	3,927,882
85B	3,927,883
119R	3,927,884
126R	3,927,885
135R	3,927,886
183B	Re.28,661

CLASS 274

38	3,927,887
39A	3,927,888

CLASS 277

25	3,927,889
29	3,927,890
190	3,927,891

CLASS 279

62	3,927,892
75	Re.28,662
	3,927,893

CLASS 280

8	3,927,894
11.13C	3,927,896
11.35C	3,927,895
11.35M	3,927,897
47.27	3,927,898
87A	3,927,899
124A	3,927,900
150AB	3,927,901
150SB	3,927,902
166	3,927,903
236	3,927,904

CLASS 290

43	3,928,771

CLASS 292

169.22	3,927,905
262	3,927,906

CLASS 293

71R	3,927,907

CLASS 294

19R	3,927,908
81R	3,927,909
99R	Re.28,663

CLASS 295

36R	3,927,910

CLASS 297

15	3,927,911
388	3,927,912

CLASS 303

6C	3,927,913
21F	3,927,914
	3,927,915
22R	3,927,916
68	3,927,917

CLASS 307

116	3,928,772
225C	3,928,773
229	3,928,774
252C	3,928,775
252N	3,928,776

CLASS 308

3.6	3,927,918
6R	3,927,919
36	3,927,920
134.1	3,927,921

CLASS 310

8.2	3,928,777
8.3	3,928,778
168	3,928,780
194	3,928,779

CLASS 312

234	3,927,922
252	3,927,923
263	3,927,924

CLASS 313

54	3,928,781
249	3,928,782
270	3,928,783
389	3,928,784
411	3,928,785
493	3,928,786

CLASS 315

403	3,928,787

CLASS 317

111	3,928,788
136	3,928,789

CLASS 318

286	3,928,790

CLASS 320

7	3,928,791
35	3,928,792

CLASS 321

2	3,928,793
5	3,928,794

CLASS 324

28CR	3,928,795
61R	3,928,796
78D	3,928,797
	3,928,798
99D	3,928,799
106	3,928,800
160	3,928,801
174	3,928,802
181	3,928,803

CLASS 325

4	3,928,804
65	3,928,805
128	3,928,806
344	3,928,807
464	3,928,808

CLASS 328

58	3,928,809
127	3,928,810

CLASS 330

4.3	3,928,811

CLASS 331

1A	3,928,812
	3,928,813
94.5PE	3,928,819
94.5C	3,928,816
	3,928,817
94.5G	3,928,820
	3,928,821
94.5M	3,928,814
94.5Q	3,928,815
94.5T	3,928,818

CLASS 332

7.51	3,928,822
11R	3,928,823

CLASS 333

1.1	3,928,824
34	3,928,825

CLASS 335

22	3,928,826
151	3,928,829
152	3,928,828
262	3,928,831

CLASS 336

70	3,928,832

CLASS 337

56	3,928,833
81	3,928,834
295	3,928,835

CLASS 338

22R	3,928,836
32R	3,928,837
183	3,928,838

CLASS 339

14P	3,927,925
74R	3,927,926
125R	3,927,927
256R	3,927,928
258F	3,927,929
278C	3,927,841

CLASS 340

3R	3,928,839
6R	3,928,840
18NC	3,928,841
146.3Q	3,928,842
172.5	3,928,857
258D	3,928,843
259	3,928,844
324AD	3,928,845
325	3,928,846
365E	3,928,847
409	3,928,848
410	3,928,849

CLASS 343

7.3	3,928,850
9	3,928,851
105R	3,928,852
180	3,928,853
735	3,928,854

CLASS 346

1	3,928,855
	3,928,856

CLASS 350

96WG	Re.28,664
151	3,927,930
184	3,927,931
187	3,927,932

CLASS 351

17	3,927,933

CLASS 354

23D	3,928,858
27	3,928,859
51	3,928,860
60L	3,928,861
86	3,928,862
109	3,928,863

CLASS 355

3R	3,927,934
14	3,927,935
15	3,927,936
	3,927,937
38	3,927,938
54	3,927,939
66	3,927,940
71	3,927,941
84	3,927,942
132	3,927,943

CLASS 356

97	3,927,944
106LR	3,927,946
106	3,927,945
117	3,927,947
167	3,927,948

CLASS 357

17	3,928,864
30	3,928,865
	3,928,866

CLASS 358

39	3,928,867

CLASS 360

15	3,928,868
55	3,928,869
59	3,928,870

CLASS 402

22	3,927,949

CLASS 403

346	3,927,950

CLASS 415

110	3,927,951

CLASS 416

95	3,927,952

CLASS 417

48	3,927,953
360	3,927,954
477	3,927,955

CLASS 418

100	3,927,956

CLASS 423

138	3,928,529
140	3,928,530
206	3,928,531
210	3,928,532
213.2	3,928,533
	3,928,534
224	3,928,535
242	3,928,536
243	3,928,537
260	3,928,538
326	3,928,539
339	3,928,540
	3,928,541
342	3,928,542
385	3,928,543
447	3,928,544
463	3,928,545
476	3,928,546
564	3,928,547
575	3,928,548
648	3,928,549
657	3,928,550
659	3,928,551

CLASS 424

1	3,928,552
	3,928,553
3	3,928,554
22	3,928,555
45	3,928,556
47	3,928,557
	3,928,558
49	3,928,559
52	3,928,560
61	3,928,561
78	3,928,562
	3,928,563
83	3,928,564
92	3,928,565
94	3,928,566
	3,928,567
115	3,928,568
117	3,928,569
118	3,928,570
	3,928,571
122	3,928,572
	3,928,573
153	3,928,574
	3,928,575
154	3,928,576
164	3,928,577
	3,928,578
167	3,928,579
177	3,928,580
180	3,928,581
	3,928,582
	3,928,583
195	3,928,584
	3,928,585
219	3,928,586
230	3,928,587
234	3,928,588
244	3,928,589
245	3,928,590
	3,928,605
246	3,928,591
	3,928,592
248	3,928,606
249	3,928,607
250	3,928,593
	3,928,608
253	3,928,609
258	3,928,610
	3,928,611
	3,928,612
263	3,928,594
	3,928,613
	3,928,614
	3,928,615
	3,928,616
270	3,928,617
271	3,928,595
273	3,928,596
	3,928,597
283	3,928,598
	3,928,599
298	3,928,600
300	3,928,601
308	3,928,602
311	3,928,618
314	3,928,619
317	3,928,620
320	3,928,622
326	3,928,623
330	3,928,603
	3,928,621
	3,928,624
	3,928,625
	3,928,626
353	3,928,604
366	3,928,628

CLASS 425

131.1	3,927,957

CLASS 426

7	3,928,630
18	3,928,631
72	3,928,632
96	3,928,633
281	3,928,634
312	3,928,635
434	3,928,636
437	3,928,637
439	3,928,638
444	3,928,639
465	3,928,640
506	3,928,641
521	3,928,642
533	3,928,643
535	3,928,644
538	3,928,645
549	3,928,646
554	3,928,647
564	3,928,648
565	3,928,649
573	3,928,252
579	3,928,650
641	3,928,651
643	3,928,652
657	3,928,653

CLASS 427

8	3,928,654
14	3,928,668
19	3,928,669
21	3,928,655
22	3,928,656
47	3,928,657
53	3,928,670
88	3,928,671
108	3,928,658
127	3,928,672
132	3,928,659
135	3,928,673
171	3,928,674
248	3,928,660
257	3,928,675
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444	3,928,682

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222	3,928,701
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297	3,928,684
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3,928,663
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3,928,649
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45 : 3,927,844
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47 : 3,927,496
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48 : 3,927,429
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49 : 3,927,836
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50 : 3,927,814
51 : 3,927,473
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53 : Re.28,656
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3,927,903
3,928,186
3,928,807
54 : 3,927,715
3,927,785
3,928,165
3,928,222
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3,928,434
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55 : 3,927,513
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3,927,610
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3,927,761
3,927,839
3,927,872
3,927,918
3,927,929
3,927,984
3,928,204
3,928,838

1	238,161		238,213	25	238,122	34	238,131		238,203	44	238,137
6	238,132	13	238,146		238,124		238,149		238,214	47	238,212
	238,134	16	238,135		238,170		238,154	39	238,159	48	238,140
	238,175	17	238,126		238,176		238,155		238,164	49	238,173
	238,192		238,129		238,196		238,194		238,165		238,174
	238,208		238,130	26	238,139	36	238,116		238,166	51	238,118
	238,209		238,143		238,158		238,136		238,167		238,119
	238,215		238,190	27	238,169		238,152		238,172		238,120
8	238,151		238,195		238,183		238,157		238,198		238,121
9	238,138		238,200		238,197		238,162		238,205		238,125
	238,142		238,201	29	238,163		238,185	41	238,178		238,150
	238,160		238,210		238,171		238,189		238,179	53	238,156
	238,184	20	238,128		238,181		238,199	42	238,206	55	238,133
12	238,127	21	238,191	33	238,123		238,202		238,211	56	238,153
	238,141										

PLANT PATENTS

6	3,818	3,819	3,820	3,823	19	3,822	48	3,821

U. S. GOVERNMENT PRINTING OFFICE : O - 1975

U.S. DEPARTMENT OF COMMERCE
Rogers C. B. Morton, *Secretary*

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*